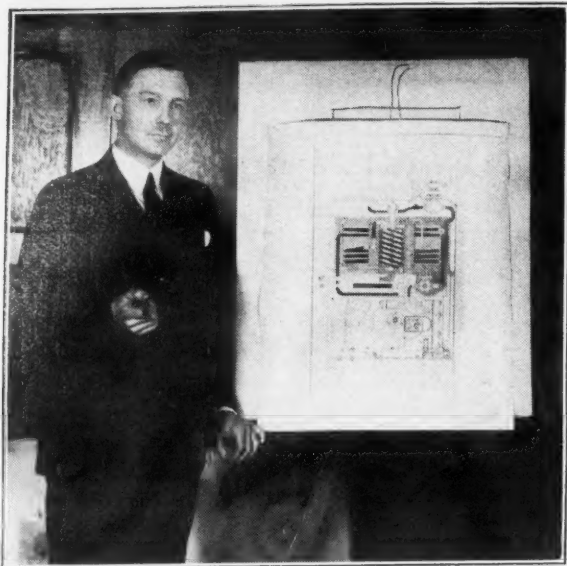


Westinghouse Plans Sales Promotion—Other Companies Busy



B. C. Davison, manager of Westinghouse commercial refrigerator service, used this chart in explaining the mechanical features of electric refrigeration to sales promotion managers from various distributorships.



More than 120 men and women, representing every state in the Union, attended a meeting of sales promotion managers for Westinghouse distributors, to learn the schedules for the giant advertising and merchandising campaign of the spring season. This is one of the classes which they attended.



R. C. Cosgrove, manager of Westinghouse commercial refrigeration, explained advantages of the new line of electric water coolers at the sales promotion meeting. Here he is discussing the micarta cabinets.



Miss Madeline Dulso, graduate of Michigan State College, is a new addition to the Kelvinator staff of factory home economists, and is conducting classes in the field.

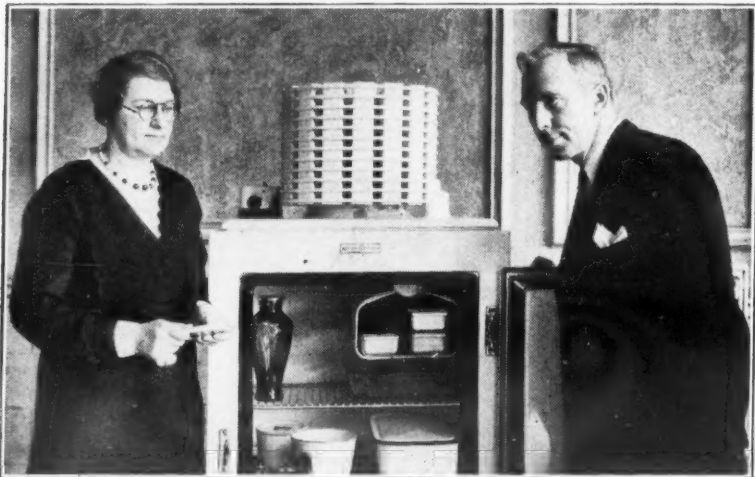
Sales Meetings Are the Order of the Day



Eastern dealers in the Starr-Freeze organization attended this banquet which closed their New York meeting.



Miss Ethel Augur, newly appointed member of the Kelvinator staff of factory home economists, is now conducting cooking schools and home service classes in the field.



In which Mr. and Mrs. Almand of Atlanta, Ga., examine the General Electric refrigerator awarded Mr. Almand by the National Life Insurance Co., of which he is local district manager. Mr. Almand has produced some business every week for eight years.



Miss Opal Larsen, 17-year-old brunette of Brigham City, Utah, was elected Snow Queen at the annual Utah carnival. She is shown with W. J. Critchlow, Jr., sales manager of the Utah Power & Light Co.



A. F. Head (right), Indianapolis vice president of Refrigerania, was awarded the Ford pick-up truck which he won in the last General Electric sales contest, by J. B. Gent (left), Ford dealer, recently. B. M. Walthall, district representative, witnessed the presentation.



These dealers and salesmen, the sales organization of the E. B. Latham Co., New York distributor of Leonard refrigerators, heard factory officials outline sales plans at the spring rally.



When Refrigerania declared war, these General Electric distributors in the Eastern part of the country congregated at Rex Cole headquarters, New York City, to hear news from the front.

ELECTRIC REFRIGERATION NEWS

The business newspaper of the refrigeration industry

ISSUED EVERY WEEK
VOL. 6, No. 31, SERIAL No. 159Copyright, 1932, by
Business News Pub. Co.

DETROIT, MICHIGAN, APRIL 6, 1932

Entered as second-class matter
Aug. 1, 1927, at Detroit, Mich.TEN CENTS PER COPY
THREE DOLLARS PER YEAR

HOUSE PASSES 5% REFRIGERATOR TAX

Majestic Introduces
New Low Price LineConventional Unit Used in Models Selling at
Factory from \$99.50 to \$149.50

By George F. Taubeneck

CHICAGO—Listed to retail at prices ranging from \$99.50 to \$149.50 f.o.b. Chicago, a new line of Majestic refrigerators—utilizing a "conventional" rotary compressor instead of the Majestic hermetically sealed unit—will be made available almost immediately by the Grigsby-Grunow Co. This line will be sold by established Majestic outlets in conjunction with the Majestic "de luxe" line of all-steel, hermetically sealed refrigerators.

This is the first time that any manufacturer has ever offered two complete lines of electric refrigerators with both sealed and "open" units, and with machines on top and bottom of the cabinet. (The "de luxe" line has a sealed unit on the top; the low-priced line has an "open" unit underneath the food storage compartment.)

The recommended time payment plan for the sale of the \$99.50 models is \$10 down and \$5 a month.

Model 335, which retails at \$99.50, can be had in three styles—regular, sink-high (with special drainboard top), and table-top.

It has 3.4 cu. ft. net capacity (N.E. M.A. rating), 8.5 sq. ft. shelf area, and freezes 42 ice cubes (3½ lbs.) at one freezing.

Priced at \$119.50 f.o.b. is the above model finished in all-porcelain. Retailing at \$125 f.o.b. is the same sized cabinet finished in black elasto, without legs and on casters, for offices.

A model with 4.7 cu. ft. net capacity (N.E.M.A. rating) and 10.7 sq. ft. shelf area is listed at \$129.50 f.o.b. finished in elasto, and at \$149.50 finished in porcelain.

According to Majestic engineers, the new refrigerating machine costs much less to produce than the hermetically sealed unit which goes into the "de luxe" line.

It is of the pendulum rotary type, and does not use a flapper valve. The discharge is relieved through a timed orifice in the shaft; the machine discharges.

(Concluded on Page 4, Column 4)

JOHNSON HEADS MAJESTIC
REFRIGERATION PROMOTION

CHICAGO—Grigsby-Grunow Co. announces the appointment of A. R. Johnson as sales promotion manager of the refrigeration division.

Mr. Johnson has had experience as manager of the Chicago office of a national advertising agency. For four years he handled all advertising of the Hoover Co., maker of vacuum cleaners.

Klopp Joins Staff

CHICAGO—Charles R. Klopp has been appointed sales representative for Majestic refrigerators to cover Southeastern territory, according to an announcement made recently by officials of the Grigsby-Grunow Co.

Mr. Klopp comes to his new position with a long record in the sales end of the refrigeration industry, having been

(Concluded on Page 12, Column 3)

ILLINOIS REFRIGERATOR CO.
ADJUDGED BANKRUPT

STERLING, Ill.—Creditors of the Illinois Refrigerator Co. of Morrison, Ill., which was adjudged bankrupt March 31, will meet here at the office of Philip H. Ward, referee in bankruptcy, on the afternoon of April 9 to prove their claims, appoint a trustee, and consider disposition of the assets, according to an announcement made public by Mr. Ward.

QUOTA CLINCHER
PLAN TO BE USED
BY WESTINGHOUSENew Household Models
Introduced at
50 Meetings

By George F. Taubeneck

CHICAGO—Presentation of the "Quota Clincher Plan" along with seven new Westinghouse refrigerator models climaxed the dealer-salesman refrigeration conference of the Frank H. Johnson Co., Chicago Westinghouse refrigeration distributor, held at the Edgewater Beach hotel, April 1.

This meeting was one of 50 similar meetings now being conducted throughout the country by 10 Westinghouse troupes which left Mansfield last week.

Full details of the new models, which were shown by George R. Johnson, vice president of the Frank H. Johnson Co., are given on page 1 of the *Engineering Section* of this issue.

R. C. Cosgrove, formerly manager of the commercial refrigeration division and who has recently been appointed manager of the sales development and

(Concluded on Page 12, Column 4)

First Comment
ReceivedLord & Thomas and Logan
247 Park Avenue
New York

April 1, 1932

Editor:

Three hours ago I received my copy of the *REFRIGERATION DIRECTORY*, and I want to employ the first moment I have been able to get my nose out of its intensely interesting columns to tell you what a direct hit I think you have rung up. Too much can't be said for it, and I have nothing but pity for anyone connected with the industry who doesn't grab himself off a copy before they are sold out, as I expect they will be. As for mine, it has already appropriated the most important position on the office bookshelf—right between Webster's and the *Standard Rate and Data*.

COLIN G. JAMESON.

MATTHEWS BUYS ASSETS
OF ELECTRO-KOLD CORP.

SPOKANE, Wash.—E. S. Matthews, Inc., announces the purchase of assets of the Electro-Kold Corp. on March 25 at assignee sale. The firm has re-employed a large percentage of the factory payroll, and will actively continue the manufacture and sale of Electro-Kold refrigeration, according to E. S. Matthews, president.

The Electro-Kold Corp. made an assignment for the benefit of creditors to the Spokane Merchant's Association, Feb. 11. Difficulties of the corporation were caused by heavy losses in its accounts receivable during 1930 and 1931, according to Mr. Matthews.

The new company is composed of E. S. Matthews, president; D. W. Mather, secretary and treasurer; Harry A. Gale, plant superintendent; Arthur A. Wilson, sales manager. All of these men were formerly employed by the Electro-Kold Corp.

Mr. H. L. Masterson, former general manager of the Electro-Kold Corp., is not connected with the new company. Sales plans, advertising, and new models will be announced shortly, according to Mr. Matthews, who said "Due to the fact that there are over 100,000 Electro-Kolds in use and placed on the market during the past eight years it was most advisable for the Electro-Kold Corp. to continue in its operation."

Estimate Revenue at
Six Million DollarsManufacturers' Wholesale Price Used as Base
In Tax Bill; Sent to Senate

WASHINGTON, D. C.—The revenue bill as passed by the House of Representatives April 1 carries a tax of 5 per cent of the manufacturers' wholesale price on "Household type refrigerators (for single or multiple cabinet installations) operated with electricity, gas, kerosene, or other means (including parts therefore sold on or in connection therewith or with the sale thereof)."

The bill also provides the same tax on "component parts" of mechanical refrigerators.

It does not tax parts sold by manufacturers to another manufacturer, but it does tax parts sold by the second manufacturer or producer, provided they are not sold as part of a completed refrigerator.

These provisions, under the law, must be worked out by the commissioner of internal revenue and no definite statement can be made now as to what parts will be taxable and under what specific conditions.

It is the purpose of the bill, as explained by Acting Chairman Crisp of the House ways and means committee, to collect the tax from the manufacturer on his wholesale price. Crisp said he was satisfied the manufacturers would pass along the tax to the consumer.

The bill does not make any provision for automatic elimination of the tax after two years, as has been done in the case of certain other taxes. Chairman Crisp explains, however, that any subsequent Congress may repeal the tax.

Latest estimates submitted to Congress by the treasury department and the ways and means committee place the revenue to be derived from the mechanical refrigerator tax at six million dollars annually. Original estimates placed the annual revenue at four and one-half million.

The bill has now gone to the Senate and it is impossible to predict what will happen to the mechanical refrigerator tax there.

The prevailing impression here is that the Senate will rewrite many provisions

(Concluded on Page 12, Column 3)

Generalissimo

GORDON SMITH
Alabama distributor leads General
Electric soldiers in war.SMITH LEADS FORCES
IN G. E. SALES DRIVE

CLEVELAND—Gordon Smith, president of the Alabama Refrigeration Co., distributor for General Electric refrigerators in Birmingham, Ala., has for the past two weeks retained the title of Generalissimo in the General Electric Refrigeration department's Monitor Top War Campaign.

This title, which carries with it a solid gold medal studded with a large diamond, was conferred upon Smith at the close of the first week of the campaign after he led the nation in percentage of quota. He still maintained a good lead at the end of the second week.

The accomplishment of sales to quota by A. Wayne Merriam, Inc., who but a short time ago took over the distributorship for General Electric refrigerators in Albany, N. Y., formerly held by

(Concluded on Page 12, Column 3)

NORGE SHOWS 241% GAIN
IN FIRST QUARTER SALES

DETROIT—For the fifteenth consecutive month sales of Norge electric refrigerators showed a gain over the same month of the preceding year, according to a statement by Howard E. Blood, president of Norge Corp.

"Our sales for the first quarter ending March 31, 1932, were 241 per cent of the corresponding quarter last year, while sales for March, 1932, were 151 per cent of those of March, 1931," said Mr. Blood.

"This showing," continued Mr. Blood, "not only indicates a very definite response to our enlarged sales promotion and advertising campaigns this year over last, but also reflects the general increased buying activities reported in other lines."

GENERAL MOTORS OPENS
SHOWS WITH CEREMONY

DETROIT—With the official pomp and ceremony and clamoring crowds of the type usually attendant upon movie premieres in Hollywood, Calif., or presidential inaugurations, the exhibits of General Motors products in 55 leading cities opened simultaneously at 2:30 o'clock Saturday for a week's run.

In Detroit, seat of the General Motors automobile operations, the show was opened with a program including O. W. Koehler, director of sales, General Motors Co.; Mayor Frank Murphy of Detroit; Louise Fazenda, movie actress; and Coon-Sanders orchestra.

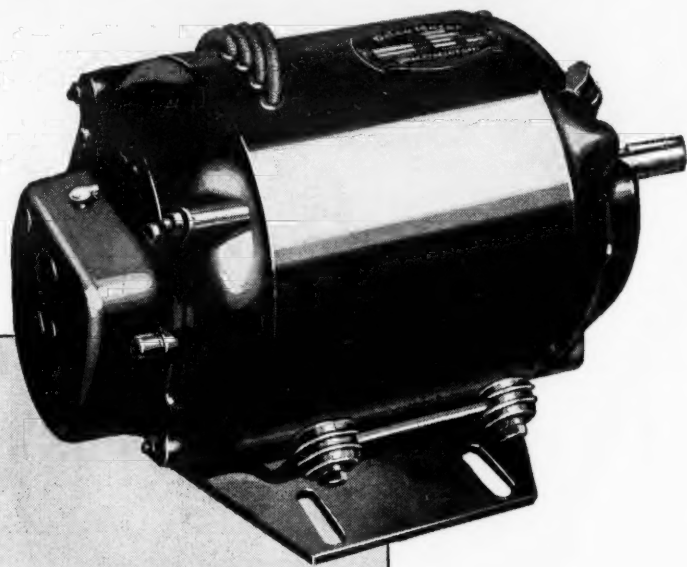
Included in the Frigidaire exhibit are the white porcelain and Moraine lines; the new Faraday gas absorption refrigerator; Frigidaire commercial machines and cooling coils, and the Frigidaire unit room cooler.

SIX DISTRIBUTORS NAMED
BY ELECTROCHEF

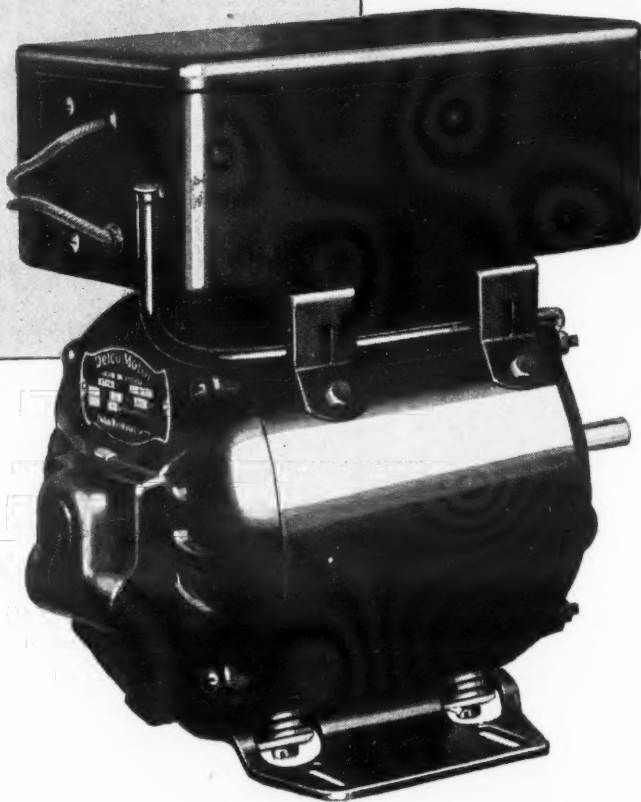
DETROIT—Six new distributor outlets for Electrochef ranges are announced by Gerald Hulett, sales promotion manager of Electromaster Inc.

The distributors are: Strong, Carlisle & Hammond, of Cleveland and Columbus; Reinhard Bros., with offices in Minneapolis, Aberdeen, and Minot; Capital City Paper Co., Springfield, Ill.; Universal Electric Co., Dallas, Tex.

H. M. Tower Corp., New Haven, Springfield, Mass., and Boston; Western Supply Co., Salt Lake City.



A REFRIGERATOR MOTOR MUST NOT FAIL



... and, likewise, a motor manufacturer must not fail in making deliveries! Delco makes a practice of shipping as promised, regardless of quantity. When the "Spring rush of orders" starts flowing in to electric refrigeration manufacturers, Delco invariably meets every demand for motors. Operating on a flexible production schedule, Delco is able to change its manufacturing program almost immediately. This does not mean rigid standardization of the product, however. Delco designs every motor individually to fit each application. And Delco condenser-transformer and repulsion-induction type motors are establishing impressive records for dependable performance under the most difficult operating conditions. Delco's complete designing and manufacturing service is available to any refrigerator company with a motor problem to solve.

National field service for Delco Motors is provided through the facilities of United Motors Service Branches

DELCO PRODUCTS CORPORATION

DAYTON, OHIO

Refrigeration To Be Fair Feature

CHICAGO—Exhibits of modern refrigerating equipment for the home will be one of the features of the Home and Industrial Arts exhibit of Chicago's 1933 World's Fair, the plans for which are now being developed by officials of A Century of Progress Exposition.

This home show which is under the direction of Ely Jacques Kahn of New York, will offer an opportunity to participate to every interest that contributes to the construction, furnishing, decorating and equipment of the home.

A large "I" shaped structure running north and south, including a two-story building at each end, connected by a series of pavilions or galleries along a colonnade, will be the dominating building of this exhibit group, according to present plans. The exhibit will be located on the Fair grounds south of the replica of old Fort Dearborn.

Home Equipment

The exhibits of modern refrigerating equipment, it is planned, will be shown in the north building. In this building, also, will be displays of building materials and construction, and home equipment from electric washing machines to home heating plants, air conditioning and ventilating equipment to kitchen stoves, cabinets and a variety of other labor-saving devices.

The pavilions which lie between and connect the north and south buildings will, it is planned, be devoted to presentations of household furnishings such as glassware, pottery, draperies, silver, leather, metal, fine woods, etc.

Model Home Decorations

The building at the south end of the galleries will be devoted to the decorative arts, comprising a series of rooms completely furnished. A large number of designers throughout the country will be invited to participate in arranging these rooms and the materials, it is proposed, will be provided by various manufacturers of furnishings and draperies.

"The Home and Industrial Arts Exhibit, embracing every detail of the home and making it a better place to live at less cost," said Mr. Kahn, "will be in the character of expositions held abroad, in Paris, Berlin, Stockholm and elsewhere, but never before shown in America."

Displays of modern home refrigeration equipment will also be shown in a group of modern homes which will lie close to the large building, and which will demonstrate the uses of new building materials, new uses for old materials and new construction methods.

Plan Home Construction

Already arrangements for the construction of four of these homes have been made and plans for others are being developed. These will be designed by some of America's foremost architects and are expected to set a new trend in architectural design, as well as in interior furnishings, equipment and decoration. Everything that is new in decorative treatment, furnishing and equipment will be displayed by the makers of these products.

Allied with these houses will be exhibits of building materials and methods of construction. The general plan also contemplates a pavilion for the study of city planning and exhibits of municipal and sanitary engineering.

"By means of the Home and Industrial Arts show," said Mr. Kahn, "it is hoped to encourage the utilization of the same brains and initiative for the development of beautiful and efficient homes as America has demonstrated in the development of machines."

SERVEL DEALERS OUTLINE SPRING SALES CAMPAIGN

LANCASTER, Pa.—Plans for spring sales campaigns on Servel electric refrigerators in this territory were outlined before a meeting held recently at Darmstaetter's, Servel Hermetic dealer in this city, which was attended by representatives of all Lancaster dealers and their salesmen, and dealers from nearby towns.

The meeting was in charge of Mr. Alexandre of the Schaffhauser-Kiley Corp., Servel Hermetic distributor in the Philadelphia, Pa., territory, and W. W. Patton, Servel district sales representative.

Mr. Patton discussed sales promotion and advertising plans for the year, and spoke on the possibilities for increased refrigerator sales for the salesman who is willing to go out and get the business.

The meeting was one of a series being conducted by the distributor organization to outline plans for pushing spring sales.

ALTON, ILL., DEALER NAMED FOR SERVEL HERMETICS

ALTON, Ill.—Manlove & Wilkening of this city has been appointed dealer for Servel Hermetic electric refrigerators by the Brandt Electric Co., Servel distributor, St. Louis.

ANNUAL OIL BURNER SHOW OPENS MONDAY

BOSTON, April 6.—A virtual sell-out of exhibition space for the ninth annual convention of the American Oil Burner Association, Inc., which opens Monday morning at Mechanics Bldg., is reported by Harry F. Tapp, executive secretary of the association.

Convention registration will begin early Monday morning, and the formal opening of the show will take place at 7 o'clock that evening. The program culminates with the annual banquet and ball of the association on April 14 in the Imperial Ballroom, Hotel Statler, and the Dealers Frolic the following night.

Dealer's Division Meeting

A meeting of the dealers division will be held the afternoon of Tuesday, April 12, according to A. W. Clark, managing secretary of the division, at which 25 members will be elected to the dealers board of governors for the ensuing year. Lionel L. Jacobs, chairman of the board, will preside.

A meeting of the executive directors of this division will be held on the opening day of the convention.

Tuesday afternoon will be marked by a meeting of the board of directors of the association at 2 o'clock in the Hotel Statler. Trade practice problems will form the basis of discussion.

Directors Will Meet

The annual meeting and election of directors will be held Tuesday morning at 11 o'clock in the Mechanics Bldg.

Business sessions of the convention will get underway Wednesday morning in Paul Revere Hall, Mechanics Bldg., under the chairmanship of E. V. Walsh, general sales manager of the Timken Silent Automatic Co.

The morning session will include talks by the following: B. K. Breed, commercial and industrial sales engineer of Preferred Utilities Co., "The Commercial and Industrial Oil Burner Market;" Walter F. Tant, president of the American Oil Burner Association, "The Job Ahead."

Robert Tinsman, president, the Federal Advertising Agency, "Sales Planning and Advertising," and T. K. Quinn, vice president of General Electric Co., whose subject will be "Salesmanship as a Profession."

A meeting of the Manufacturers Division is scheduled for Wednesday morning, and only members of this division will be admitted. The first session of the new executive directors of the dealers division will be held simultaneously.

Thursday morning the meeting will be opened by John H. McIlvaine, president of the McIlvaine Burner Corp., who will introduce Joseph B. Murphy, general sales manager of the Taco Heater, Inc., who will deliver a paper on "Domestic Hot Water Supply."

Air Conditioning

Vincent S. Day, chief engineer of Carrier-Lyle Corp., will speak on air conditioning; R. G. Bookhout, editor of *Plumbing & Heating Contractors Trade Journal*, will discuss "Pouring Oil on Troubled Waters." Prof. L. E. Seeley, of Mason Laboratory, Sheffield Scientific School, Yale University, will give a technical research report.

Mayor James W. Curley will be chief speaker at the banquet which precedes the annual ball Thursday night. He will be introduced by Edward P. Bailey, president of the National Oil Burner Co., who will act as toastmaster.

Final Day's Program

Friday, "Dealer's Day," the morning's program will mark the end of the business sessions, the afternoon and Saturday morning being given over solely to the show itself.

On the final program will appear Lionel L. Jacobs, president of Electrol of New Jersey, and the following speakers: Ralph B. Wilson, vice president of Babson's Statistical Organization, who will speak on "Business Conditions," Katharine A. Fisher, director of Good Housekeeping Institute, who will discuss "Selling Women on Heating and Cooking with Oil Fuel."

R. M. Sherman, president, Silent Glow Oil Burner Corp., who will point out the "Place of the Distillate Burner in the Industry," and C. W. Cornelissen, manager of the retail division of the May Oil Burner Corp., who will speak on "Directing Retail Salesmen."

7 DEALERS COOPERATE IN OKLAHOMA CITY EXHIBIT

OKLAHOMA CITY—Seven makes of refrigerators were exhibited at Oklahoma City's first electrical show, in Market Square Garden recently. Visitors numbering 25,000 attended the show, and more than \$200,000 worth of merchandise was on display.

Exhibitors and the refrigerators which they displayed included: Jenkins Music Co., Ice-O-Matic; Brown Electric Co., Norge; Ahren's Refrigerator Co., General Electric; Montgomery Ward & Co., Trukold; W. C. Dance Co., Frigidaire; Tom Cooper Motor Co., Kelvinator; and McEwen-Halliburton Dry Goods Co., Westinghouse.

NOW • a book of evidence proving that G·E·DEALERS MAKE MONEY

GET YOUR COPY ▶▶

ARE THE DEALERS
MAKING MONEY?

The Evidence

FARNHAM ELECTRIC COMPANY
Electrical & Radio

The Leifley Co.,
Portland, Oregon.

Nov. 14, 1931.

Gentlemen:

Attention of L. A. Isermann

In the two and a half years I have been a General Electric dealer my experience with General Electric refrigerators has been most pleasant and profitable.

Competitive makes have been placed in homes in this locality, of course, but I have found that the discriminating men and women who go beyond the price appeal of a cheaper make will choose the General Electric. Public acceptance of a General Electric product is always most favorable as there is the complete assurance of the General Electric backing, which is something the customer seems to require on an electric refrigerator, a comparatively new member among electrical home necessities.

Servicing costs on a General Electric refrigerator never worry the dealer as they amount to practically nothing. Satisfactory operation is taken as a matter of course and after installation is made, with perhaps a future call for minor adjustments or as a courtesy follow-up, I consider my work done and I find I am seldom disappointed.

As for enthusiastic users, if they have a General Electric refrigerator it naturally follows that they are enthusiastic, and in a small town, where everyone knows everyone else, other sales follow as a matter of course.

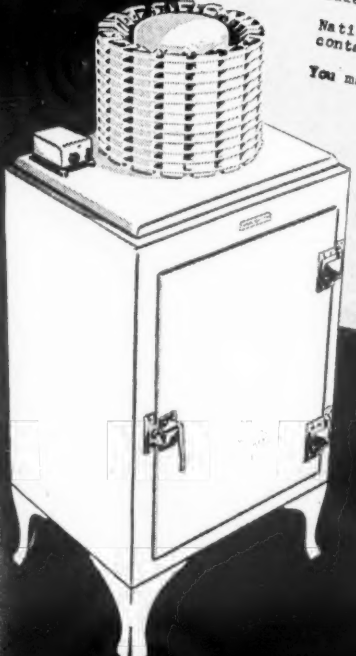
National advertising and sales helps tie in with the personal contact and could not be dispensed with.

You may reproduce this letter should it be selected.

Yours very truly,

Farnham Electric Co.

By Leslie Farnham



HERE'S a book of facts—written testimonials from General Electric dealers all over the United States—proving that G-E dealers are making money. No disputing this evidence: dealers everywhere report that G-E Refrigerators provide a more rapid turn-over on a smaller investment. The almost complete absence of servicing means greater NET profits. The profit margin is consistently maintained. General Electric's vigorous advertising and merchandising policy makes door-opening easier for dealer salesmen. An outstanding national advertising campaign; year 'round direct mail; outdoor postings; slide films for salesmen to show prospects in their own homes; coast-to-coast radio—all these carry the message of Monitor Top superiority to millions of homes—bring the story of the General Electric's unparalleled performance record direct to the customer—make sales easier and profits longer and faster for General Electric dealers. Write now for your copy of "Are G-E Dealers Making Money?". General Electric Company, Electric Refrigeration Department, Section DF 41, Hanna Building, Cleveland, Ohio.

GENERAL  ELECTRIC
ALL-STEEL REFRIGERATOR

DOMESTIC, APARTMENT HOUSE AND COMMERCIAL REFRIGERATORS — ELECTRIC WATER COOLERS

April Issue of Refrigerated Food News Relates Functions of Refrigeration

INDICATIONS of the growing importance of the technology of food refrigeration to the manufacturer of refrigeration equipment, as well as to various divisions in the food industry, make themselves evident in the news stories about refrigerated food carried in the April 1 issue of REFRIGERATED FOOD NEWS.

For instance, one of the top-column stories on page 1 of the 16-page issue reports that the Frigidaire Corp. is loaning refrigerating equipment to the Delta Experiment Station, Stoneville, Miss.

Director W. E. Ayres of the Mississippi experimental station explains that quality of meats in southern and sub-tropical climates has never been good because successful meat curing is dependent upon the speed with which animal heat is removed from the carcass.

By use of advanced methods of refrigeration, Ayres hopes to find a way to make plantation meat curing more of a success.

Kroger Super-stores

On the front page is a story which deals with the amount of refrigeration equipment that is being installed in new super-stores of the Kroger Grocery & Baking Co. chain. These food retailing palaces use approximately 100 ft. of top refrigerated display counter, and have a series of walk-in coolers with a food storage area of nearly 3,000 ft.

From 15 to 25 individual units, or one large refrigerating system with a like number of thermostatic controls would be needed to cool the amount of refrigerating equipment installed.

A review of the Second Annual Packaging Exposition held recently in Chicago makes the point that appearance will be the big factor in the design of

the 1932 package, in keeping with the modern retailing theory that eye appeal is a great present day factor in selling. Packagers also made it clear that they are giving not a little thought to the matter of giving a wrapper or a package protection against conditions it will encounter when kept in the refrigerated display case, a piece of equipment designed to aid the retailer obtain a maximum of display.

Servel Builds Condensing Unit

Servel, Inc., builds a new 3-cylinder condensing unit with one-ton capacity, to carry heavier loads than could previously be handled with one Servel condensing unit. The Baker Ice Machine Co. announces its 1932 line, which carries six condensing units powered by motors ranging from 1/4 to 1 1/2 hp. Summerheat Corp. of America announces production plans for the American Ace commercial refrigerating unit. The Commercial Coil and Refrigeration Co. reports a line of evaporator coils in 158 standard sizes.

How ice cream specialty shops and drug stores employing unit freezers to make and harden ice cream in their own stores, have built a prosperous trade in Chicago during the past year is related in a page 1 story, and further elaborated upon on the "Soda Fountain and Ice Cream Service" page.

New Cream-O-Matic Freezer

Grand Rapids Store Equipment Corp., maker of the Zeromatic and Chillo-matic lines of display cases enters the unit homemade ice cream making system field with a Cream-O-Matic freezer.

The field of quick-frozen foods is pretty well dissected in two interviews which start on the front page. Both in-

terviews present views by men who speak with authority—one being the chief executive of a leading manufacturer of refrigerating equipment and an earnest student of frozen foods as a potential market for the equipment his firm produces; and the other being a chain store executive who has had some experience in the retailing of quick-frozen foods.

Food merchandising theories are being put to work in Pittsburgh, with 30 of the steel city's grocery stores submitting their stores as experimental stations to test the findings made by the U. S. Department of Commerce in its Louisville, Ky., grocery survey of last year. A report of this move is to be found on page 3.

Woodroof's Report Published

The section of the April 1 issue of REFRIGERATED FOOD NEWS given over to "Studies in the Science of Food Refrigeration" is devoted to a complete report of the experimental work done by J. G. Woodroof of the Georgia Experimental Station on the effects of preservation by freezing as a commercial practice.

The article by Mr. Woodroof, who is considered an authority in this type of experimental work, presents facts and interpretations gleaned through long periods of research without any commitments towards one side or another in the controversy which has raged on the matter of freezing as a means of food preservation.

In the section on "Display Case Manufacture and Use" are announcements of new models, and factory and dealers operations of display case concerns. Presented on this page also is a table prepared by the research division of the refrigeration department of the General Electric Co. demonstrating the relation between relative humidity and shrinkage in unpackaged meats. There is another one of the articles dealing with the proper placement of meats in the refrigerated display case.

Tuna Fishing Growth

Few people are aware of the fact that refrigeration to a large extent made possible the growth of the tuna fishing industry from a business producing less than 100,000 cases of canned fish a season, to an industry which in 1930 packed approximately 1,920,000 cases.

Elverton B. Stark, West Coast writer who has followed the growth of the tuna fishing game, writes with interesting detail of the part refrigeration has played in this epochal development, and describes the operation of the refrigerating systems in the fleet of more than 50 tuna cruisers.

Refrigeration's part in the operations in kitchens of hotels and institutions is explained in articles appearing on page 9. One story deals with the manner in which refrigeration is used in the Morrison Hotel in Chicago and the other tells of the installation of DoleCo units in the new Victory Lawson Memorial Y. M. C. A. hotel.

An idea of what refrigerated food means to the food consumer, especially to Mrs. American Housewife, may be gleaned from the column "Through a Woman's Eyes," written by Gertrude Stanton, assistant editor of REFRIGERATED FOOD NEWS.

Bakery, Candy Market

Retail bakery shops and candy makers are finding that refrigeration can take an important part in the progress of their enterprises, according to stories reported on page 11.

Birdseye Frosted Foods is planning to increase its production of frozen foods during 1932, it is disclosed in a statement made by C. M. Chester, president of General Foods Corp. (of which the Birdseye Packing Co. is a subsidiary) printed in a story carried on page 12. Other news of the quick-freezing field may be found on this page.

Manufacturers and distributors of refrigerating equipment who wonder why railroads have taken more interest in the possibility of use of mechanical equipment in refrigerated cars will find a factual statement of the car owner's stand in statements made by F. S. Welsh, vice president of Merchants Despatch, Inc., which appear on the page entitled "Progress in Refrigerated Transportation." Other news stories concerning the manufacture and use of refrigerated methods of transportation are to be found on this page.

Increased Cooling Efficiency

Possibilities for increased efficiency in production through the use of direct expansion cooling methods in the country milk receiving station as outlined by G. E. Wallis, vice president, Creamery Package Mfg. Co., is the headline article in the section on "Dairy Refrigeration and Operation."

The dairy exhibit at the 1933 Century of Progress, use of new pasteurizing and cooling equipment, the results of the legal battle on California's milk bottle return law, and the manner in which milk is refrigerated in a children's hospital are the basis for other stories in this section.

How the proper methods of food refrigeration are being broadcast to the housewife by home service workers and other agencies is pointed out in the section on "Refrigeration Education for the Housewife," in which may also be found a number of recipes for frozen desserts and pies.

Majestic Brings Out Standard Line of Refrigerators in Low-price Class

(Concluded from Page 1, Column 1)

ing from the compression chamber on the outside of the rotor through an orifice in the rotor which is timed with an orifice and slot in the shaft.

The entire refrigerating unit may be removed at once, in six to 15 minutes, as variously estimated by the Majestic officials.

Majestic designed and built are the evaporator and the motor. The 1-6 hp. motor is rated at 172 motor watts, and delivers 2.44 B.t.u.'s per watt.

The refrigerant is sulphur dioxide; the seal is a bellows syphon; the float valve (flooding system) is in the evaporator; the control on the smaller model (335) is thermostatic, and on the larger model (345) is Ranco temperature.

Designed by Majestic Engineers

This new unit was designed entirely by Majestic engineers. Thus a considerable saving is effected, inasmuch as it is not necessary to pay a royalty on each unit—as is the case with the Lipman-designed Majestic hermetically sealed unit.

The new unit is now going through Majestic production lines without interference to production of the hermetic unit. All cabinets for the new line, including porcelain models, are being made at the Majestic factory on Dickens Ave. here.

More machines have been added to this plant to effect labor savings, a new factory working schedule is in force in

been worked out for the new line, including slide films, portfolio material, and carefully edited suggestions to salesmen. In all literature for dealers and salesmen the idea is stressed that "price alone will not make the sale."

Only one national advertising medium will be used: the *Saturday Evening Post*. Distributors and dealers are expected to do much newspaper advertising. A few trade papers, including *ELECTRIC REFRIGERATION NEWS*, will also carry the advertising message, according to Earl Hadley, advertising manager.

Specifications

Specifications on the new line of refrigerators follow: model 335 (standard)—3.4 cu. ft. net (over 4 cu. ft. gross). Shelf area: 8.5 sq. ft. Height of cabinet: 45-9-16 in., 8 in. legs; bevel top. Width of cabinet: 24-3-16 in. Depth of cabinet: 21 1/2 in. (over hardware 22 1/2 in.). Weight: 234 lbs.; crated, 265 lbs. Quantity to 40-ft. car: 102. Number of ice trays: 2. Ice at one freezing: 3 3/4 lbs. Cabinet finish: elasto.

Model 335 (standard)—sink-high, 3.4 cu. ft. net. Shelf area: 8.5 sq. ft. Height of cabinet: 36 1/2 in., no legs; flat top. Width of cabinet: 24-3-16 in. Depth of cabinet: 21 1/2 in. (over hardware 22 1/2 in.). Weight: 234 lbs.; crated, 265 lbs. Quantity to 40-ft. car: 102. Number of ice trays: 2. Ice at one freezing: 3 3/4 lbs. Cabinet finish: elasto.

Model 335 (standard)—table-top, 3.4 cu. ft. net. Shelf area: 8.5 sq. ft. Height of cabinet: 36 1/2 in., no legs; flat top. Width of cabinet: 24-3-16 in. Depth of cabinet: 21 1/2 in. (over hardware 22 1/2 in.). Weight: 234 lbs.; crated, 265 lbs. Quantity to 40-ft. car: 102. Number of ice trays: 2. Ice at one freezing: 3 3/4 lbs. Cabinet finish: elasto.

Black Office Model

Model 335 (standard)—office style, 3.4 cu. ft. net. Shelf area: 8.5 sq. ft. Height of cabinet: 36 1/2 in., no legs; flat top (extra height for casters). Width of cabinet: 24-3-16 in. Depth of cabinet: 21 1/2 in. (over hardware 22 1/2 in.). Weight: 234 lbs.; crated, 265 lbs. Quantity to 40-ft. car: 102. Number of ice trays: 2. Ice at one freezing: 3 3/4 lbs. Cabinet finish: black elasto.

Model 835 (standard)—porcelain, 3.4 cu. ft. net. Shelf area: 8.5 sq. ft. Height of cabinet: 45-9-16 in., 8-in. legs; bevel top. Width of cabinet: 24-3-16 in. Depth of cabinet: 21 1/2 in. (over hardware 22 1/2 in.). Weight: 234 lbs.; crated, 265 lbs. Quantity to 40-ft. car: 102. Number of ice trays: 2. Ice at one freezing: 3 3/4 lbs. Cabinet finish: porcelain.

Model 345 (standard)—4.7 cu. ft. net (over 5 1/2 cu. ft. gross). Shelf area: 10.7 sq. ft. Height of cabinet: 52-15-16 in., 8-in. legs; bevel top. Width of cabinet: 24-3-16 in. Depth of cabinet: 21 1/2 in. (over hardware 23 1/2 in.). Weight: 284 lbs.; crated, 321 lbs. Quantity to 40-ft. car: 68. Number of ice trays: 2. Ice at one freezing: 3 3/4 lbs. Cabinet finish: elasto.

Model 845 (standard)—porcelain, 4.7 cu. ft. net. Shelf area: 10.7 sq. ft. Height of cabinet: 52-15-16 in., 8-in. legs; bevel top. Width of cabinet: 24-3-16 in. Depth of cabinet: 21 1/2 in. (over hardware 23 1/2 in.). Weight: 284 lbs.; crated, 321 lbs. Quantity to 40-ft. car: 68. Number of ice trays: 2. Ice at one freezing: 3 3/4 lbs. Cabinet finish: porcelain.

VAUGHAN WINS PRIZE IN G. E. DEALER RECRUIT WORK

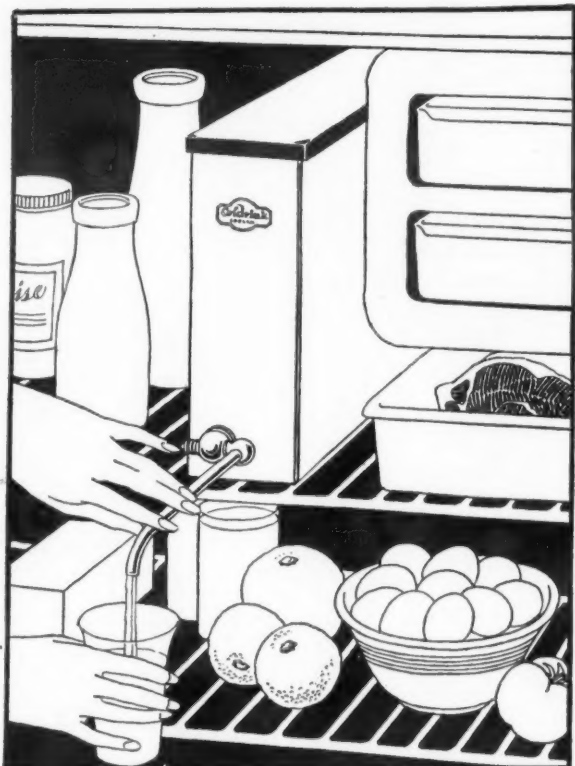
CLEVELAND—J. A. Vaughan, wholesale manager for the E. O. Cone Co. distributor of General Electric refrigerators in El Paso, Tex., was this week awarded \$500 in cash, first prize money in the recently concluded "Dealer Recruiting Campaign" staged by the dealer division of the General Electric refrigeration department.

Second prize, \$300, went to M. B. Mendenhall, wholesale manager for the Warde B. Stringham Co., distributor in Des Moines, Iowa.

Other prize winners among the managers were H. B. Fisher, Willis Co., Akron, Ohio; Albert Ahrens, Ahrens Refrigerator Co., Oklahoma City; W. B. Wiley, George Patterson, Inc., St. Petersburg, Fla.; Fred Salt, George Belsky Co., Ltd., Los Angeles; J. E. Elomquist, Frank Edwards Co., Salt Lake City; John G. Sorg, Frank W. Wolf, Inc., Buffalo.

In the competition between district representatives first prize of \$100 was won by R. H. Ferguson, representative for the refrigeration department in the midwest; second prize, \$75, by B. M. Wathall, central district, and third, \$50, A. E. Freshman, southwestern district.

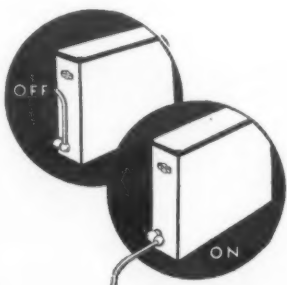
Wholesale Manager Vaughan obtained 275 per cent of quota of new dealers and Mendenhall realized 259 per cent of quota. Nearly half of the distributors in the United States obtained 100 per cent or more of quota, thus adding more than 1,600 new General Electric refrigerator dealers to the organization.



COLDRINK COOLER

... a profitable specialty

A new household convenience enjoying enthusiastic approval everywhere, and making extra profits for refrigerator dealers. The Coldrink Cooler eliminates fumbling in a refrigerator for a bottle or pitcher of water. Just open the refrigerator door and turn down the faucet for a cool drink. Made of sheet steel finished in vitreous enamel. Has a chromium finish rust-proof faucet and holds more than a gallon. Nothing to connect to refrigerator, no service required. Cash in on the Coldrink this season. Write today for information on prices, discounts and distributor proposition in your market.

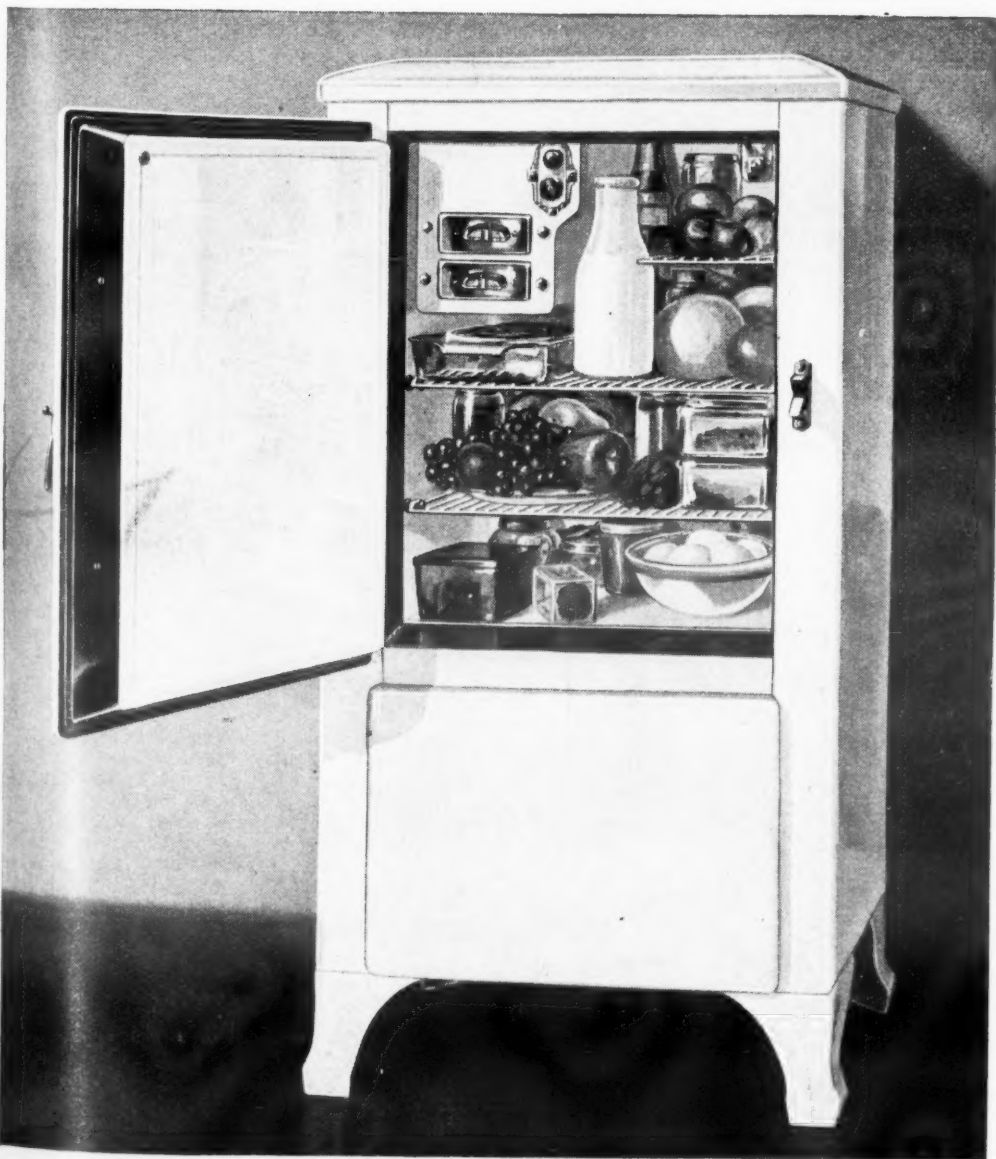


HAMBURG BROS., PITTSBURGH, PA.
963 LIBERTY AVENUE

"HAVE YOU
HEARD?"



Kelvinator Reduces Prices!



HERE'S big news for Kelvinator dealers to pass on to their prospects — a big sales stimulus at the strategic moment, just at the beginning of the heavy selling season.

Kelvinator prices were already substantially lower than they were in 1931, in spite of the many improvements incorporated into all 17 Models. And Kelvinator dealers have already eclipsed all previous sales records for the first two months of the year.

Think what a strong competitive sales advantage this price reduction gives them.

Please note that this is a general reduction on all Kelvinator lines — the semi-automatic "K" Models with eight freezing speeds — the Standard and DeLuxe types, which are the only *fully automatic* electric refrigerators — the commercial line for all industries.

Now, at the lowest prices in Kelvinator history, Kelvinator dealers can offer their domestic and commercial prospects the highest Kelvinator quality ever built and the most complete lines of refrigeration equipment on the market.

Would you like to know the complete Kelvinator profit story for dealers? Address **KELVINATOR CORPORATION, 14245 Plymouth Road, Detroit, Michigan.** *Kelvinator of Canada, Limited, London, Ontario.* *Kelvinator Limited, London, England.*

Kelvinator

LITTLE STORIES OF INTERESTING
PEOPLE
IN THE REFRIGERATION INDUSTRY

THE EXPANSION VALVE

By George F. Taubeneck

LITTLE STORIES OF INTERESTING
IDEAS
IN THE REFRIGERATION INDUSTRY

A Saga of Work

Viewed from any direction or at any particular point, the story of B. J. Grigsby, chairman of the board and president of the Grigsby-Grunow Co., is a Saga of Work.

Upon one of the rare times when he can pause for a moment of reminiscing, the turbulent stream of memories which rolls through his mind is almost, if not altogether, composed of mental pictures of tasks, jobs, and positions.

Though 48 years have been crammed with work and little else but, the retrospect is not wearying to him, nor does he crave rest and freedom from worries. Nothing holds forth so much pleasure to him as a knotty problem, and nothing gives him keener joy than working his way out of jams.

(Some day The Expansion Valve may present Mr. Grigsby's story on: "Getting Out of Jams.")

Born Jan. 15, 1884, in Cuba, Illinois, he went to public schools in nearby Peoria. Following high school—in which he took a number of commercial subjects, and learned stenography—he studied electrical engineering at the University of Illinois.

His knowledge of stenography, he believes, enabled him to get the most valuable training of his life. For two years as a youth he was secretary to R. D. Clarke, a Peoria distiller who had extensive banking and public utility interests.

That opportunity to observe at close range a real executive in action gave him an early insight into business methods, an insight which soon was to be tested under fire.

Hard Labor

Before his secretarial experience, however, went a string of hard-labor jobs.

He carried newspapers on a regular route for two dollars a week. When he was 13 years old he hauled clay from the pits to the coal yard of a brick kiln.

(In this latter job he worked 10 hours a day, using two horses half a day each, and taking care of them at the end of the day. Mr. Grigsby observes that while the valuable horses were allowed to work only half a day, the small boy worked more than a day and thought nothing of it.)

In his teens he went into the electrical contracting business, and one summer he installed all the electrical equipment in a coal mine.

During the depression of 1904 he went to John Finley, then head of the Peoria street railway department, and asked him for an engineering job. John replied that he was laying engineers off, not hiring them.

"Tell you what I'll do, though," grinned Mr. Finley. "I could use an extra conductor. I dare you to take the job."

Mr. Grigsby took the dare, and had a lot of fun that summer as street car conductor and motorman. His bantering friends boosted the number of fares considerably along that line.

On the Road Up

Immediately after he left the University of Illinois in 1906 he went to Chicago to join the Benjamin Electrical Mfg. Co. as a draftsman.

At that time the Benjamin concern was quite small—it had but 50 employees when Mr. Grigsby arrived. But it grew rapidly, phenomenally, and the ambitious young men who were there on the ground floor had a chance to rise with it.

The rapid rise of Benjamin was more than paralleled by the sensational rise of the Grigsby-Grunow Co. two decades later; and undoubtedly the experience Mr. Grigsby had in those early years with Benjamin helped him make decisions and keep his sense of balance in the dizzy years of 1928 and 1929.

While he was with Benjamin he took out some 150 patents, designed many lines of electrical goods.

English Bayonets

In England at that time bayonet lamp sockets were used exclusively. Mr. Grigsby was given the task of redesigning the Benjamin line of lamp sockets to fit English requirements.

This he did, and when Benjamin executives decided to establish Benjamin Electric, Ltd., at London, England, they decided upon Mr. Grigsby as the most

likely candidate for the job of managing director.

Shortly before his embarkation for England, Benjamin officials gave him a dinner. At this dinner some executive happened to ask Mr. Grigsby how old he was.

His answer appalled the officials. He was only 24 years old!

Already he was partially bald, and so energetically and steadily had he applied himself to his job that his employers supposed he was many years older.

Managing Director

In 1908 he established Benjamin Electric, Ltd., at London; and for the next eight years he was managing director of that concern. Under his guidance

par value of \$100 each, and 1,500 shares of common stock of no par value.

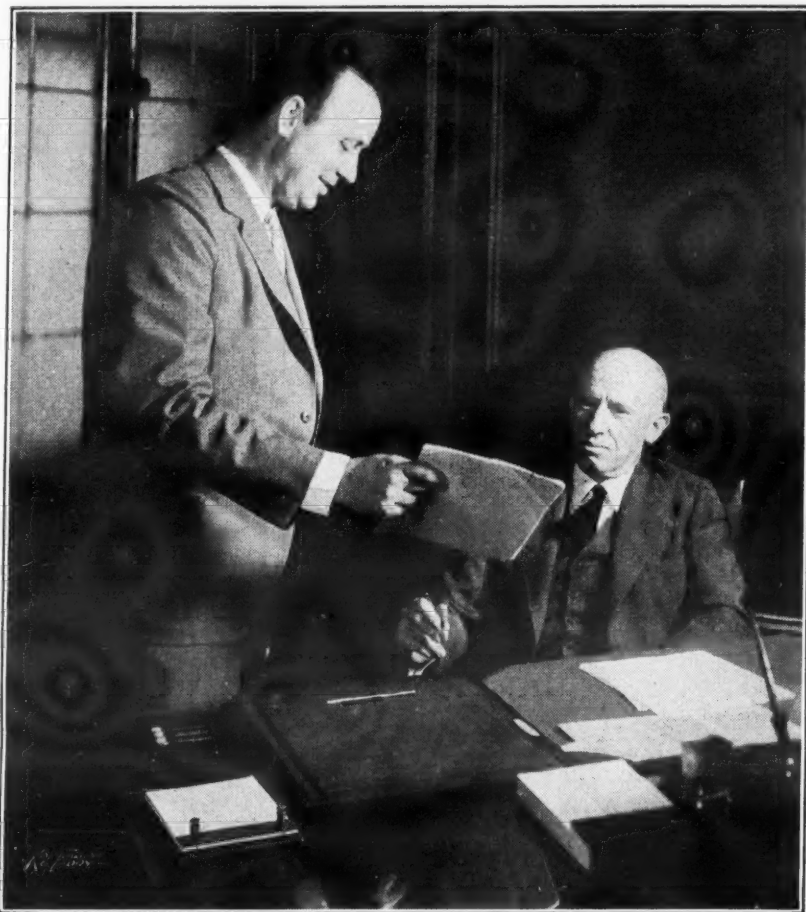
This stock was increased and changed May 10, 1927, to 40,000 shares of common stock of no par value. On February 17, 1928, this was increased to 100,000 shares of no par value.

The name was changed to the Grigsby-Grunow Co., March 19, 1928. The stock was increased Oct. 5, 1928, to 500,000 shares of no par value, and on Aug. 14, 1929, this was boosted to 2,000,000 shares of no par value.

Story of the Rise

How fast this company grew—as shown by the above figures—is a matter of common knowledge. In the second year of its business (1923) sales of the Grigsby-Grunow-Hinds Co. exceeded \$1,000,000, with a net profit of \$243,000 after depreciation, but before taxes.

Mr. Grigsby Decides



B. J. Grigsby, chairman of the board and president of the Grigsby-Grunow Co., is asked for a decision on an important matter by Earl W. Macke, who has been associated with Majestic's chief executive for 12 years.

Benjamin made great strides in capturing England's scientific and industrial illumination market.

Also for two and a half years his factory was devoted to the task of making instruments of war. From the day of its organization up till now Benjamin Electric, Ltd., has not omitted a dividend.

He married an English girl, who presented him with a boy (now 20, a sophomore at the University of Michigan), and a girl (now 18). Because he wanted his boy to grow up in an American atmosphere, he decided to return to the United States.

Organizing and Reorganizing

In December, 1916, he came back to the United States, and almost immediately began reorganizing the Anderson Electric and Equipment Co., which manufactured dental and surgery products and automobile accessories.

Mr. Anderson had been a model maker with Benjamin, a man with creative mechanical talent who lacked business acumen. In the reorganization of this concern, Mr. Grigsby contributed \$10,000 in cash and Mr. Anderson \$15,000 in debts.

Until March, 1917, Mr. Grigsby was vice president and general manager of that company. By that time he had built the business up to a point where it was doing a business of \$600,000 per annum.

Grigsby-Grunow-Hinds

Disposing of his Anderson interests, he organized the Grigsby-Grunow-Hinds Co. to manufacture automobile accessories. Mr. Grunow had been hired as an auditor for the Anderson company. Mr. Hinds, a college mate of Mr. Grigsby, had been in the Anderson sales department.

The Grigsby-Grunow-Hinds Co. was incorporated Nov. 16, 1921, under the laws of the State of Illinois, with an authorized capital of \$150,000, consisting of 1,500 shares of preferred stock of the

In 1924 the closed car, complete with accessories, replaced the open car in popular favor. That sounded the death knell of the accessory business, but Mr. Grigsby didn't wait to hear it.

They hand on hand a quantity of material for the making of automobile sunvisors. This material, they learned, could be used in the manufacture of radio loud speakers.

Loud speakers were expensive in those days, and Grigsby-Grunow-Hinds Co. was first to bring out a low-priced line. In Mr. Grigsby's

office today you will find one of the \$12.50 models.

An A and B battery eliminator was developed and marketed in 1925 and in February, 1926, the Majestic B battery eliminator, dry type (others were acid type) was marketed with much success.

Majestic Radios

Along about that time Mr. Grigsby came to the conclusion that the trend in the radio industry would eventually be toward a complete set, just as the automobile—which was first sold without accessories—was then being sold fully equipped by manufacturers.

Majestic engineers started work designing a radio set. Furniture making—one of the biggest radio manufacturing problems—was studied intensively.

Mr. Hinds didn't catch the vision, and left the fold in the spring of 1928, when the first Majestic complete radios were placed on sale.

Mr. Grigsby and Mr. Grunow were agreed that the market was ripe for a complete, quality radio produced on a mass production basis and sold at reasonable prices. They were right; and being first in the field, profited.

Set No. 1 is now in Mr. Grigsby's office. And a handsome radio it is, too.

Modern Midas

Previously they had sold automobile accessories through jobbers without territorial arrangements. With their new radios they decided to establish an exclusive territorial distribution set-up.

In April, 1928, they invited a selected list of established distributors, most of whom had been jobbing their other products, to see the new Majestic radios. These distributors came in regional groups, saw, and were conquered.

For the remainder of the year the Grigsby-Grunow Co. could not manufacture enough radio sets to keep these distributors supplied.

A recapitulation of sales figures during that time is almost hair-raising. We present Mr. Grigsby's fiscal year figures:

1927—sales of battery eliminators, five and one-half million dollars.

1928—sales of radio sets, forty million dollars.

1929—sales of radio sets, sixty-one million dollars.

The peak month was October, 1929, when factory billings exceeded ten million dollars, when an average of 6,000 complete sets a day was coming off the line, and when the payroll totalled 15,000 employees. At that time Majestic was also making more than 30,000 radio tubes a day.

As indicated above, the company was refinanced in 1927, when \$300,000 of stock of no par value was sold at \$25 a share. In March, 1928, a banking group purchased 29,000 shares of the 100,000 shares

to which the capital was increased. These shares were bought by the bankers at \$32 a share and marketed at \$40 a share.

A four-for-one split-up of this stock occurred twice. Hence, if Grigsby-Grunow stock were selling at \$2 a share today, it would be equivalent to the \$32 a share first paid for it by the banking group. The present shares went as high as 70.

Majestic Refrigerators

It has long been Mr. Grigsby's idea that the manufacturing of a complete line of household appliances would be a good business.

Casting ahead along these lines, electric refrigerators looked like the best bet for a starter. So early in 1929 Majestic engineers, plus others brought in, went to work on the program. By January, 1930, a satisfactory compressor had been developed.

In the meantime the market had landed, and financing became difficult. The Majestic Household Utilities Corp. was formed in April, 1930, capital was raised, and a new building and complete plant—one of the finest in the industry—were put up.

Within six months from the organization of the new corporation, Majestic refrigerators were in production.

The new product was sold through the same organization of distributors and dealers which had been handling Majestic radios.

Mr. Grunow made his exodus in the fall of 1930, and in March, 1931, the Majestic Household Utilities Corp. was merged with the Grigsby-Grunow Co. Mr. Grigsby assumed complete charge as president and chairman of the board. (All of these events were faithfully recorded in detail in the columns of ELECTRIC REFRIGERATION NEWS.)

Separate Departments

Before 1931 was far gone Mr. Grigsby decided that it was going to be necessary to separate his radio and refrigeration business.

Originally it had seemed that the two products would be ideal sales companions, inasmuch as one had a sales peak in the spring and the other in the fall. But that idea didn't work so well.

Previously radio sales had been good in March, dropped some in April and still more in May, and went to a low point in June. When Majestic dealers and distributors had refrigerators to sell, however, the decline was not gradual, it was precipitate. Sales sheered off sharply in April.

Likewise, refrigerator sales had a sudden descent in September (when radio selling gets good), and stayed down. The refrigeration industry as a whole, Mr. Grigsby noted, enjoyed a good month in October, and sales dropped slowly thereafter.

In other words, whenever it became difficult to sell one product and easy to sell the other, all sales effort on the first ceased and was transferred to the second.

Also affected was the home office, which continually had to drop promotion of one product to rush plans through for the other. Sustained effort on either thus became almost impossible.

Now the home office has two complete sets of executives—one for radio and one for refrigeration. The only overlapping departments are accounting and advertising. Mr. Grigsby seems well pleased with the results of his decision.

Since the meeting of Majestic distributors in January, refrigerator sales have jumped 200 per cent over a like period of 1931!

Mr. Grigsby Himself

Inasmuch as he has been described before in this column, it may be necessary only to note briefly that he still finds his chief pleasure in working—as evidenced by the enthusiasm with which he is greeting the introduction of the new Majestic refrigeration line, with all its attendant problems—that he is an unobtrusive, quiet, modest man, and that he still loves a battle.

His legal fights against the so-called "radio tube trust" have been a matter of national comment. This fight is still on.

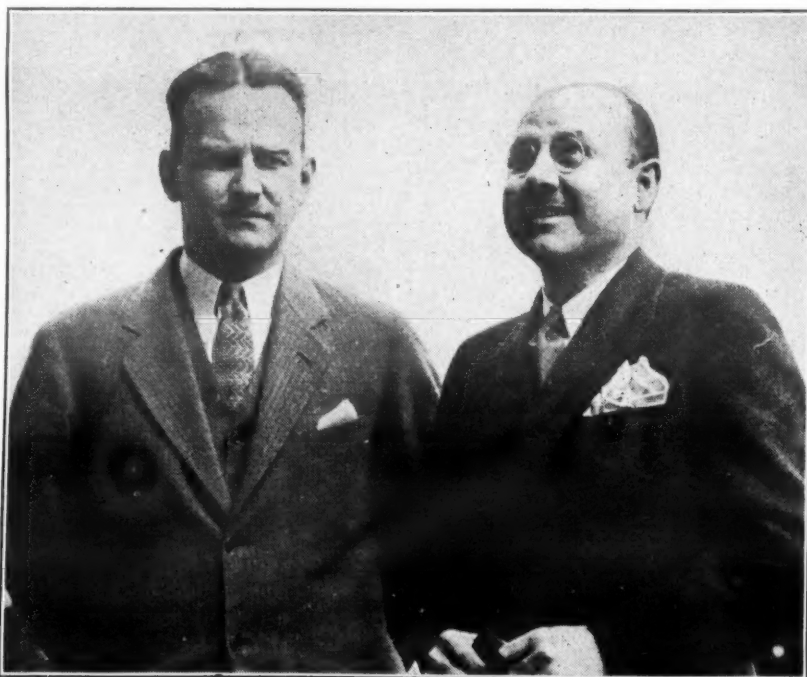
He plays golf and bridge for amusement. An auction bridge foursome—composed of John Petrie, John Brannan, O. P. Spielmann, R. J. Reichstag, and Grigsby—has been meeting more or less regularly for the last 15 years.

Reading is also one of his favorite pastimes.

His home is in Park Ridge, a Chicago suburb; although he has a farm at Barrington, Ill., where he goes frequently.

The head of a company which does things in a big, splashing way, he is himself a conservative man of simple habits, and an advocate of safety and sanity.

No Quaking in Philadelphia

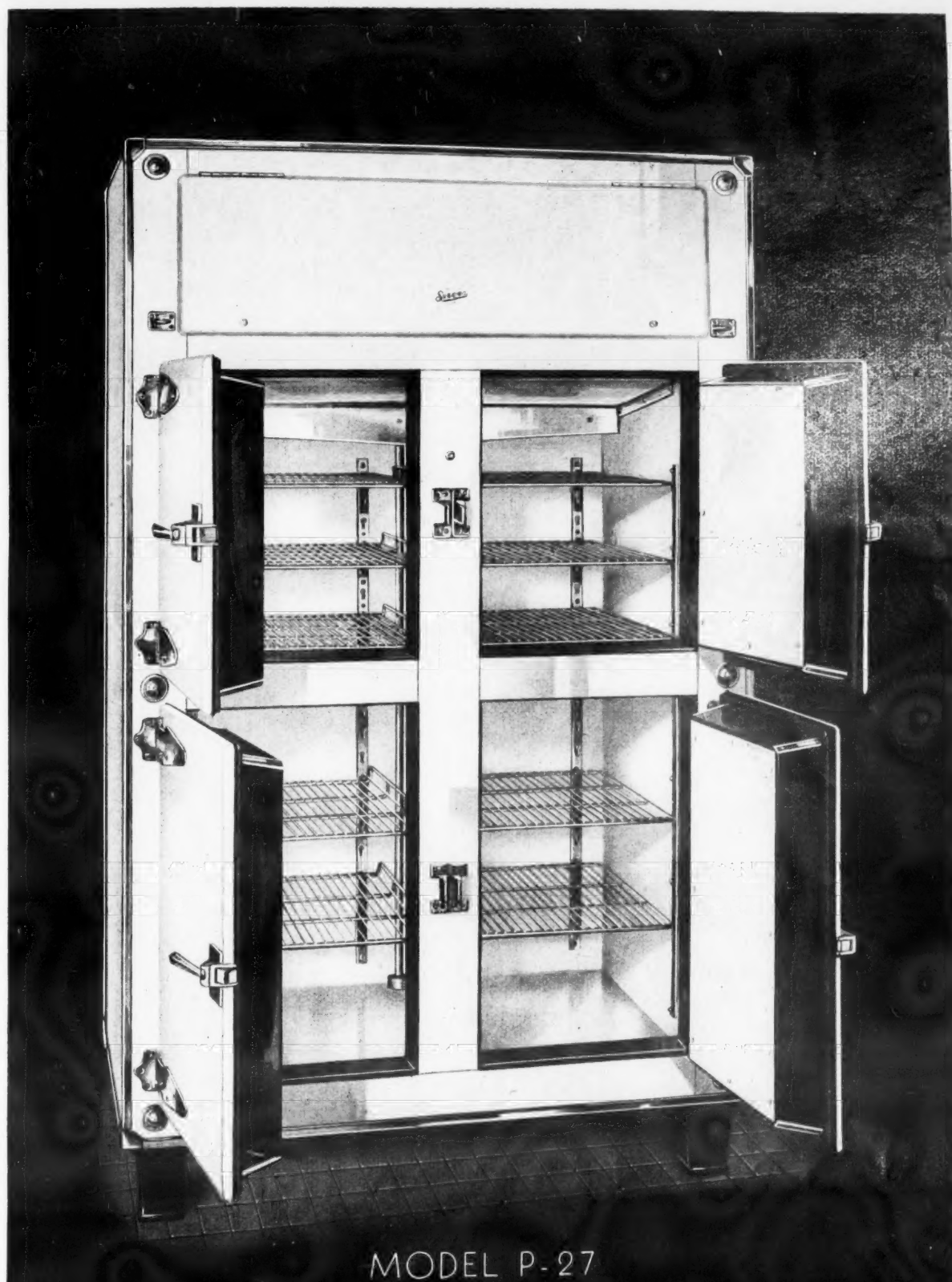


John Ditzell, Majestic refrigeration sales manager, smiles happily over prospects in Quakertown with "Trev" Peirce, Philadelphia distributor.

The New Seeger 27

Seeger now presents the New 27 Cubic ft. — a new size in Commercial Refrigeration Cabinets, in response to the demand for a Cabinet of this size with Overhead Tube or Coil Compartment — and the assurance of a large sale may be predicted by the tremendous demand.

The Seeger 27 may be had with Porcelain exterior and acid resisting porcelain interior, equipped with electric lights and adjustable shelves — or with smooth Lacquer finish sides and top and Porcelain Front, with special steel galvanized interior. Black Porcelain Legs are an attractive and practical feature of these Commercial Refrigeration Cabinets.



MODEL P-27

CABINETS BY

Seeger

SAINT PAUL

SEEGER REFRIGERATOR COMPANY.
SAINT PAUL, MINNESOTA

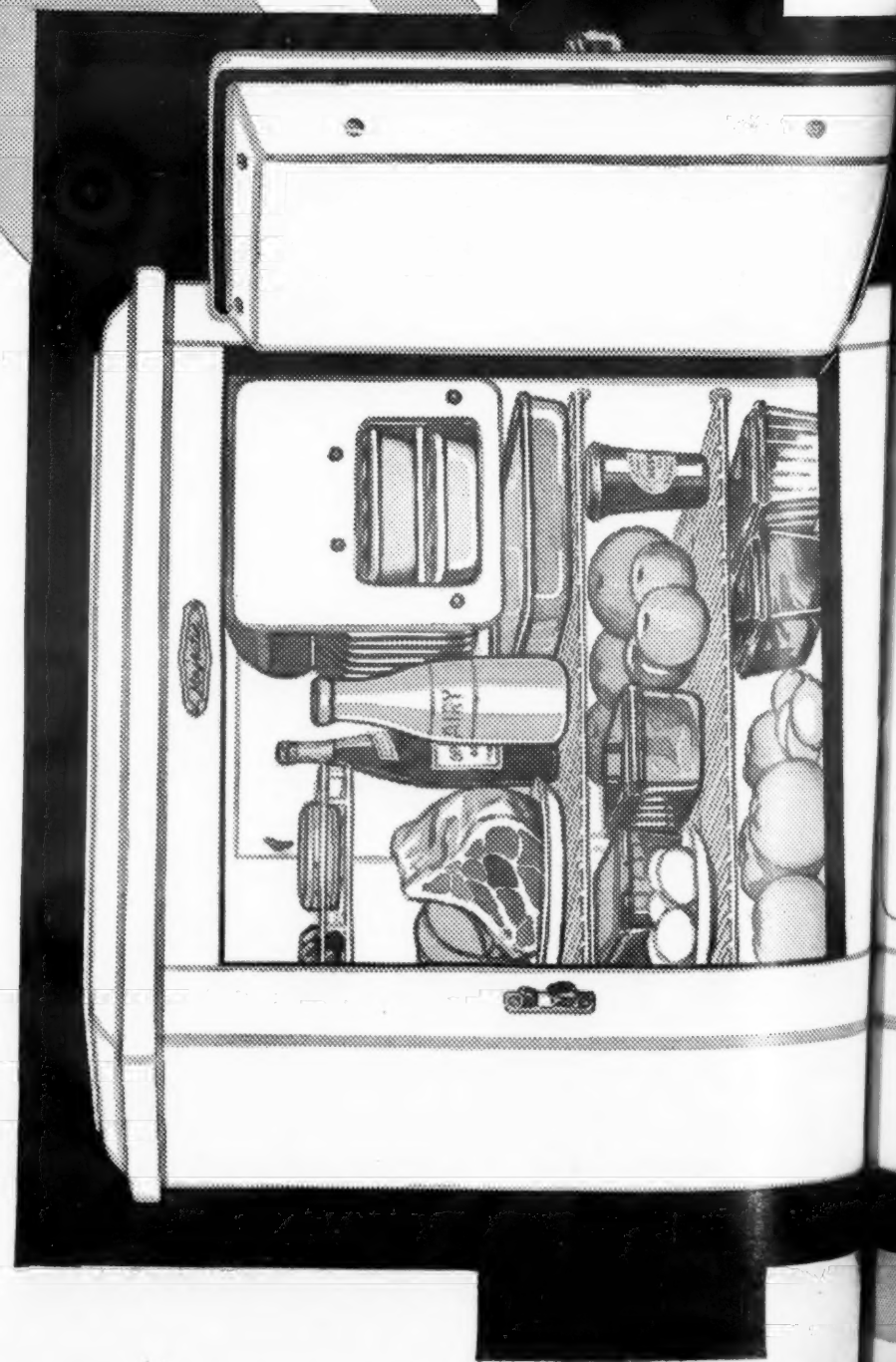
232 Fourth Ave.
Fourth Ave. at 19th St.
NEW YORK, N. Y.

655-57 So. LaBrea Ave.
LOS ANGELES, CALIF.

666 North Wabash
CHICAGO, ILL.

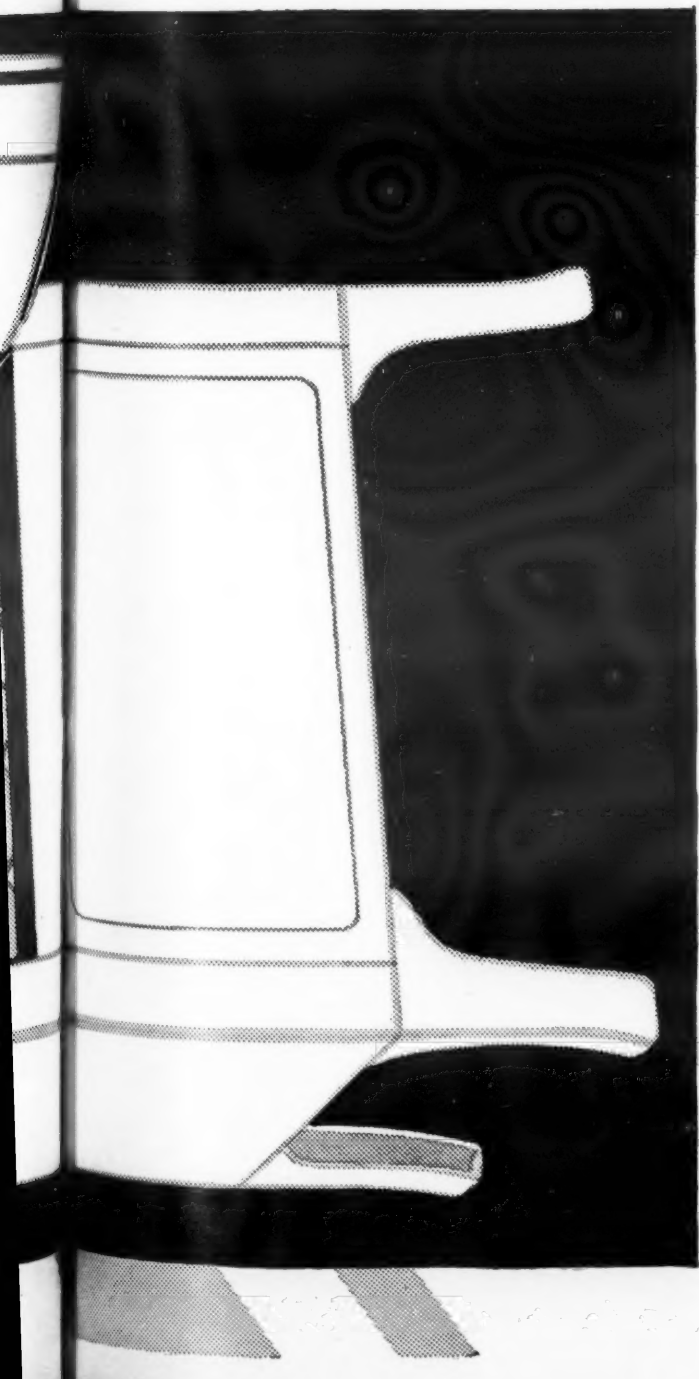
644 Beacon St.
Kenmore Square
BOSTON, MASS.

THE WORLD EXPECTED IT! MAJESTIC DONE IT!



first in the Quality field
at the sensational price of

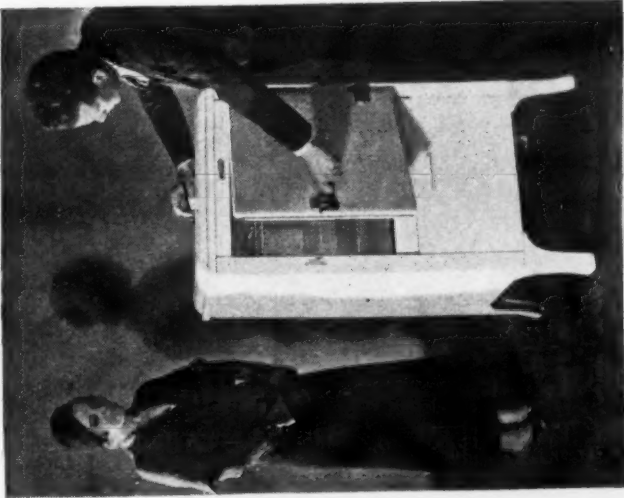
owners of Majestic Radio sets — how
you thrilled when you heard your first
Majestic all-electric radio with full de.



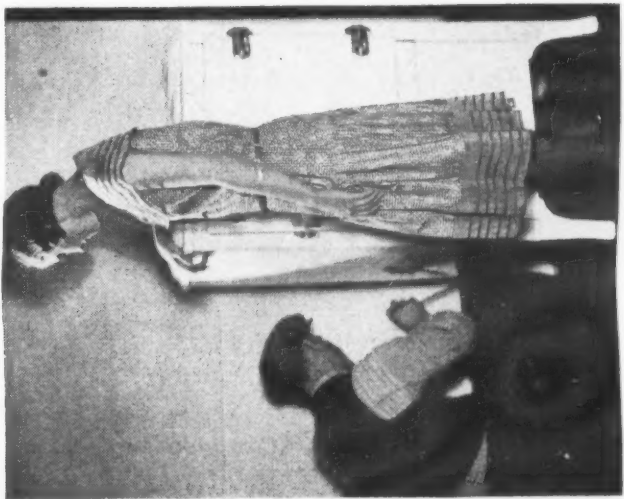
**Perfect Refrigeration
... even at high noon
in the tropics ...**

Majestic

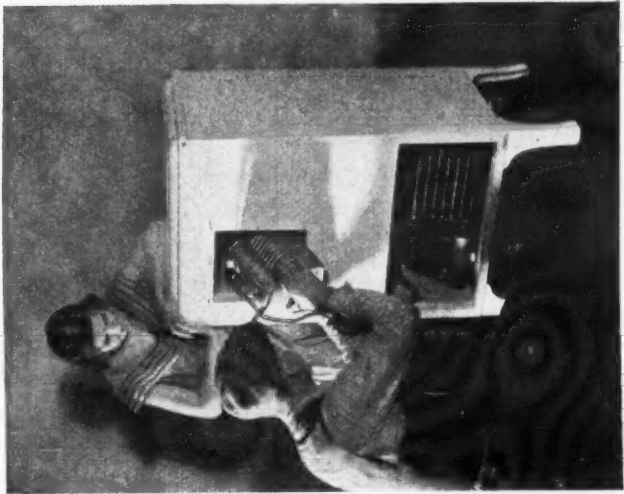
OVER • SIZE MULTI • POWERED • ALL • ELECTRIC



SELL IT . . .
Here's an electric refrigerator that fits the present public pocketbook . . . one that will turn more prospects into purchasers than any other on the market.
For this remarkable new Majestic at \$99.50 sells, on sight. And once it's purchased . . . it stays sold!
There never was an electric refrigerator which the dealer could handle with as little effort or expense.



INSTALL IT . . .
No high-priced mechanics are needed. Just deliver it and plug it in. That's all there is to it!
Should service be required at any time, you are not faced with long and costly repair jobs on the premises.
Simply send out a substitute refrigerating unit and bring the old one back for inspection and repair. The whole mechanism is built as one simple, compact "package" that any novice



and IT STAYS SOLD!
can remove and install with perfect safety—in a few minutes! Sell it . . . install it . . . and it stays sold! That's the Majestic sales story in a nutshell.
That's why dealers everywhere are flocking to Majestic. It's the best money-maker in the refrigeration field—a sure-fire business-getter with the biggest volume sales possibilities of any refrigerator offered today.

owners of Majestic radio sets—how you thrilled when you heard your first Majestic all-electric radio with full dynamic speaker?—And how you marveled at its phenomenal low price?

Wait for Majestic! That was your challenge to the skeptics when you later learned that Majestic had invested eight-and-a-half million dollars in a brand-new plant equipped with the latest automatic machinery, and had declared its purpose to make quality refrigerators *at a price within the reach of every family* . . .

Behold, now, in this new thrift-model, is your judgment vindicated!

For here, at last, is a refrigerator that fits any kitchen comfortably. Scientifically shelved, to permit full use of every cubic inch of space. Multi-powered, to assure complete refrigeration even at high noon in the tropics. Actuated by a silent compressor—*with only three moving parts!* Equipped with a factory-sealed unit that can be pulled out and replaced in *fifteen minutes*. Finished inside in stainless, china-white porcelain—every corner rounded. Finished outside in

everlasting satin-like Elasto. A refrigerator built to give you a lifetime of service at the lowest cost, *and to pay for itself in less than two years' time!*

This new Majestic is at your dealer's NOW—all ready to be plugged into a convenient socket and to start saving food and money for your family at a moment's notice.

Whether or not you already know the

satisfaction of owning a Majestic product, you are cordially invited to inspect this latest Majestic marvel, and to bring your friends. See it, by all means, before you buy. *Then match it, point by point and dollar for dollar—if you can!*

GRIGSBY-GRUNOW COMPANY, CHICAGO, and affiliates, with factories at Chicago; Toronto; Bridgeport; Oakland; London; England; and Sao Paulo, Brazil
Manufacturers also of MAJESTIC RADIOS

F. O. B. FACTORY

Price subject to any Federal or State Tax on electric refrigerators that may be levied.

Terms as low as
\$5⁰⁰
per month

We'll be glad to show you how you can cash-in on the money-making possibilities which Majestic affords. Fill in the coupon below. Mail it to us today. Your inquiry will be given prompt attention.

Grigsby-Grunow Company,
5801 Dickens Avenue,
Chicago, Ill.

Gentlemen:
Please tell me more about your new Standard models . . . and the Majestic franchise.

Name
Business Connection
Address

MERCHANDISING SECTION ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Refrigeration Industry

Published Every Week by
BUSINESS NEWS PUBLISHING CO.
Also publishers of REFRIGERATED FOOD NEWS (monthly)
and the REFRIGERATION DIRECTORY (annual)
550 Maccabees Building, Woodward Ave. and Putnam St.
Detroit, Michigan. Telephones: Columbia 4242-4243-4244
U. S. and Possessions and countries in Pan-American
Postal Union: \$3.00 per year; 2 years for \$5.00
Canada: \$6.00 per year (U. S. Money)
All Other Countries: \$4.00 per year; 2 years for \$7.00
Advertising Rates on Request

F. M. COCKRELL, Publisher

GEORGE F. TAUBENECK, Editor
JOHN T. SCHAEFER, Engineering Editor
JOHN R. ADAMS, Assistant Editor
PHIL B. REDEKER, Assistant Editor
GERTRUDE STANTON, Assistant Editor
FREDERICK W. BRACK, Advertising Manager
GEORGE N. CONGDON, Business Manager
Member, Audit Bureau of Circulations
Copyright, 1932, by Business News Publishing Co.

VOL. 6, NO. 31, SERIAL NO. 159, PART 1, APR. 6, 1932

Editorial Aims of the News

- To encourage the development of the art.
- To promote ethical practices in the business.
- To foster friendly relations throughout the industry.
- To provide a clearing house for new methods and ideas.
- To broadcast the technical, commercial and personal news of the field.

Unwelcome Compliment

IF IT were not for the unfair burden which the impending five per cent federal tax on manufacturers' sales of mechanical refrigerators will place on the industry, it might be viewed with a certain degree of satisfaction.

The fact that Congress has discovered mechanical refrigeration as a potential producer of millions of dollars of revenue indicates that this appliance has "arrived" in a large way in the consciousness of the public.

The position of the industry may be compared to that of the prominent citizen who is called upon by a committee of his fellow townsmen to rescue the community from some crisis beyond the ability and means of the constituted authorities.

When the community implores or demands that one individual contribute more than his fair share of time or money for the common good, it is a distinct compliment to the strength and stability of the individual selected.

The industry may be compared to a newly recognized member of the community who has been invited to sit in the council of elders and suddenly finds himself elected treasurer—a job which carries the "honor" of making up the deficit incurred by his predecessor.

A Fast One

Another example may be found in the realm of sport when it becomes necessary to handicap one player of unusual ability in order that weaker players may have a chance to compete with him, the handicap becomes a mark of recognized merit.

The refrigeration industry may be likened to the new member of the club who finds himself given the high handicap, and officially rated as a more skillful player than any of the older and more experienced members, when he enters the first tournament.

Considering the brief time which has elapsed since the electric refrigeration industry was a weak and struggling infant, with its elders shaking their heads doubtfully as to whether it would survive the vicissitudes of life, the recognition implied by the federal tax comes as a distinct surprise.

If the honors accorded to wealth, skill, and strength are thrust upon a newcomer in this manner, it excites suspicion that somebody has put over a fast one.

Saving the Bankers

When we remember that profits in electric refrigeration are still so new as to be novel, it seems rather strange that mechanical refrigeration should be called upon to make up the losses in-

curred by inexcusable folly, reckless waste and downright dishonesty.

With the government turning over billions of dollars to save the hides of bankers who threw away millions upon millions in the most vicious financing imaginable, we now find the burden dumped upon a young industry just barely getting its stride.

The industry is asked to accept that burden and distribute it among American homes. It means that the salesman must ask the housewife to make another payment on a contract which has already been spread over the longest possible period consistent with safety. The salesman is asked to accept one more obstacle to the sale of a product which can be sold only by the most intelligent methods being demonstrated by any business enterprise today.

The dealer is asked to mark up the price of a product which he does not hope to sell "over the counter," which few ever buy of their own accord, but which he can merchandise only after consistent education of picked prospects.

Penalizing Leadership

It is demanded that the manufacturer of electric refrigerators, who has been feverishly seeking every available means of economizing on the production cost of his product in order to get his price within the reach of a depression-scared public, must add five per cent to both his production cost and the small margin of profit which he hopes to make.

Coming right at this time, the impending tax is rather appalling. During the past few weeks manufacturers have reduced their prices to a point heretofore considered impossible. Some of the largest companies have frankly embarked upon a program which means that they will risk their investment in the business on their faith that large-quantity-production economies will justify the new price schedule. They have gone at the job with a determination to make or break. They have been fully aware of the normal resistance of the buyer. They have accepted all of the obstacles which are confronted in the sale of a high-priced specialty. They are aware of the presence of a new cutthroat competition which apparently has no other purpose than to follow in the trail blazed by the pioneers and raid the field.

An Unjust Burden

Facing all of these conditions, the industry cannot help but feel that it is being treated unjustly when it is singled out for a special tax which will add to its problems and make its progress still more difficult.

Here we have a progressive industry doing a real constructive job of improving the health of the nation; one which has, by example, pointed the way out of the snarl of the depression; one which is rendering a full measure of service for the consumers' dollar—this industry is asked to accept the burden caused by the greed and corruption of others.

It may be a compliment, but it certainly is an unwelcome one.

GLEANINGS FROM RECENT PERIODICALS

FUNDAMENTAL ECONOMIES IN PRODUCTION

WHILE the past 15 years have witnessed great strides in the solution of production problems and the automatization of equipment used by industry, equal attention, it seems, has not been given to the abstract science of economics.

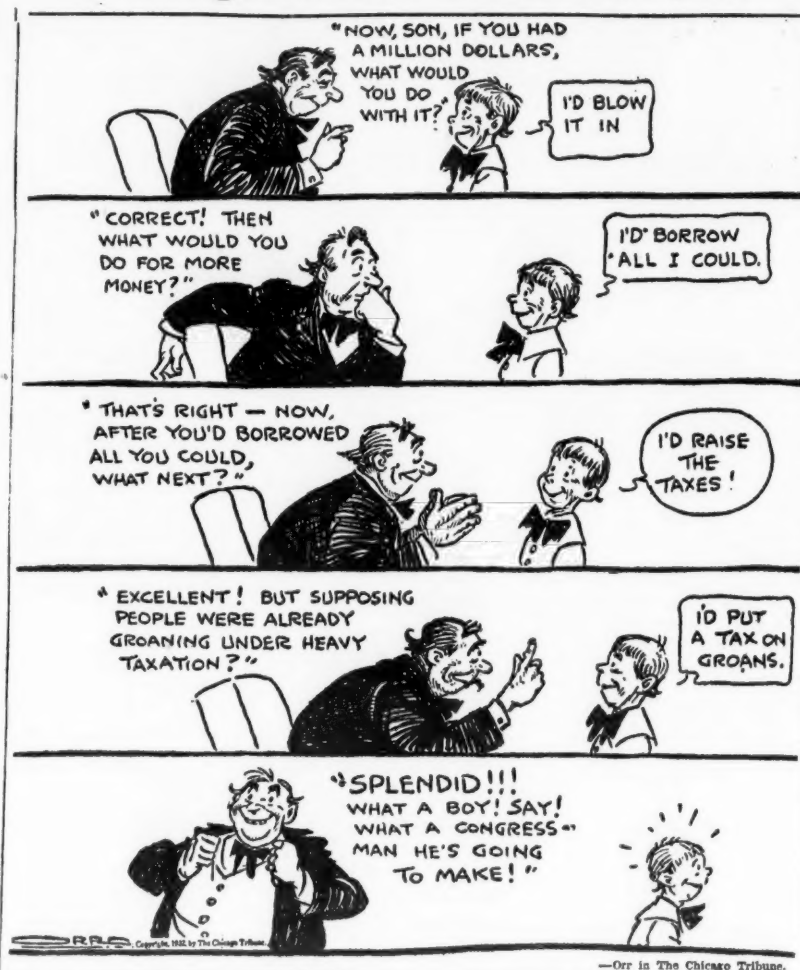
A most valuable lesson in this connection is presented by the present state of business, for it is only in times of stress that the weak members of our industrial machinery are shown in bold relief.

There are certain fundamental principles of economics that are of vital importance to every plant and it makes little difference whether the plant specializes in large-production runs or limited-quantity-custom production. Cash and credit are the "life-stream" of business, hence the successful executive must keep them in a "normal" condition as regards his business. This necessitates a familiarity with the "state-of-health" of commerce and business in general.

Economic engineering is more than simple bookkeeping or accounting, for it further implies that thought be given to market development, new products, seasonal production problems, efficient management and improved production methods. There is an imperative demand for more efficiency in distribution and less waste.

An aggressive policy in the search for new facts and new lines of development will ultimately yield large returns, for history shows that most important organization and product evolutions occur in periods of economic stress.—*Metal Stampings*, March, 1932.

A Congressman Tests His Son



Letters from Readers

Without a Struggle?

Uniflow Mfg. Co.
Erie, Pa.

March 31, 1932.

Editor:

Just read in the local paper last night the following, in reference to sales tax: "The committee amending levying a 5 per cent tax on wholesale price of mechanical refrigeration, expected to return four and one-half million dollars, was adopted."

Do you understand this to mean that it was agreed upon by the committee or was actually passed by the House? Is the refrigeration industry satisfied to have all refrigerators taxed 5 per cent without a struggle?

If this has been passed by the House, do you know when it will become effective and does it apply on orders already received and accepted but not shipped or does it apply only on new orders which will be received after the tax becomes effective?

We also notice in the same article that Alvin McCauley, president of the National Automobile Chamber of Commerce, indicated that the automobile industry will fight against this tax on motor cars.

MICHAEL A. MARTIN,
General Sales Manager.

Why Discrimination?

Merchant & Evans Co.
2035 Washington Ave.
Philadelphia, Pa.

March 30, 1932.

Senator James J. Davis,
Washington, D. C.

We notice the excise sales tax which has been imposed by the House of Representatives upon "mechanical refrigerators." We have no way of knowing what this term is supposed to cover but presume that the tax will fall upon the manufactured units which combine to form the usual mechanical household refrigerator. These divisible elements can be divided into three sections.

1. The cabinet.
2. The motor furnishing the power.
3. The refrigeration machine.

These are integral elements and the manufacturing tax would fall on these elements at their source, no doubt.

If the foregoing statement of the proposed tax is substantially correct then it would be in order for Pennsylvania firms engaged in the manufacture of any one of these elements to place before you their views as to the merits of the impost.

The household refrigerator has evidently been singled out as the one electrical or mechanical appliance in use in the home which is not considered as a necessity but as a luxury. While undoubtedly the mechanical refrigerator has invaluable increased the hygienic care and preservation of food and thus inculcated added to healthy conditions, it evidently in the minds of the Ways and Means Committee of the House has not emerged from the "luxury" class into the "necessity" class; while evidently in their minds the vacuum cleaner, the gas and electric range, the electric iron and the legion of electric appliances have become "necessities"

and thus a discrimination has been made against the refrigerator which has more to do with the improvement of health conditions for both children and adults than has been due to any other appliance that has been introduced in the field in all time.

The refrigeration industry is young and it has sailed in a stormy sea during the period of development, from a financial standpoint. Just as in other great pioneer industries, it has taken years to bring about a settled state so as to permit the prospect of a low return on the investment in the industry. Heretofore this has not been achievable. Is it not fair, therefore, for the Senate to inquire into the reasonableness and equity of a levy on this particular article of industry which seems to have been discriminated against? Is not also the tax proposed comparatively inequitable in that it lays such a comparatively high burden on refrigeration, as compared with automotive products? Why 5 per cent on refrigerators and 2 per cent on motor trucks? Will not you use your influence to have the Senate give due consideration to the extent of the application of this tax?

I have given in briefest outline the attitude of mind of this organization respecting the method of classification of the domestic refrigerator in comparison with other articles of the household.

Should it be the intent of the House to include under the term "mechanical refrigerators" as it is reported in the newspapers so-called "commercial" refrigeration and water cooling apparatus, the burden on refrigeration would be practically doubled and it would involve a great setback upon the development of a very important phase of improved methods of food care and preservation; and so far as water cooling is concerned, of great and more economical development of healthy water drinking during the day by persons employed in offices and plants.

The extension of mechanical electric refrigeration amongst food stores, in ice cream and soft drink establishments, among the farmers for milk cooling and for care and preservation of dairy products and in many other uses, is an important and beneficial movement and it seems to me questionable whether a tax of 5 per cent on such products is comparatively equitable and whether the burden should not be distributed somewhat over other appliances, and this particular industry relieved of such a high percentage, with a reduction to perhaps half the contemplated tax.

This company is thoroughly in sympathy with the proposal to balance the national budget by raising necessary taxes but believes it to be the strictest duty of the Congress to levy these taxes equitably and equally upon every class of industry that is taxed—all in proportion with respect to the whole and in relation to the field of respective industries. This company emphatically believes that it is incumbent upon the Congress to keep the tax burden within the limits necessary to balance a budget which must be reduced by the Congress radically below the present level of expenditure. The business of this company has suffered a reduction in both dollar and tonnage volume comparable to the

(Concluded on Page 12, Column 3)

MAJESTIC REFRIGERATORS

The new STANDARD Line, starting at \$99.50, in combination with the HERMETIC Majestic Refrigerator representing the finest in quality, gives the dealer a potential sales volume greater than ever. Why hesitate . . . this is a Majestic Refrigerator year and we are ready to serve you in our territory.

THE HARRY ALTER CO.

MAJESTIC DISTRIBUTORS

1730 South Michigan Ave.

CHICAGO, ILL.

The World Expected It— *Majestic* Has Done It!

This is a Majestic year!

Majestic dealers have outstanding values to offer more prospects than ever before.

The New Standard Line, beginning at \$99.50, plus the Majestic Hermetic Refrigerator Line constitute a real profit-making opportunity for the dealer.

Write or wire for details.

ESTABLISHED 1883

DETROIT MAJESTIC PRODUCTS CORPORATION

DISTRIBUTORS

MAJESTIC REFRIGERATION

MAJESTIC RADIO

101-7 E. Jefferson

DETROIT, MICH.

17-19 Ionia St.
Grand Rapids

1840 No. Michigan
Saginaw

In Iowa and South Dakota it's MAJESTIC!



One out of every five refrigerators
sold in this territory last year was
MAJESTIC

And a Majestic sold *stays* sold!
Now, with the New Standard Model at \$99.50, dealers handling Majestic have the outstanding value in the quality field and the most complete line in the industry.

HIEB RADIO SUPPLY CO.

ESTABLISHED 1879

MAJESTIC DISTRIBUTORS

DES MOINES, IOWA

Branch at Marion, So. Dakota

Majestic PRODUCTS

RADIO—REFRIGERATOR—TUBES

EXCLUSIVE

DISTRIBUTORS

EASTERN PENNSYLVANIA

SOUTHERN NEW JERSEY

NORTHERN DELAWARE

PEIRCE  PHELPS

FIFTH AND NOBLE STS., PHILADELPHIA, PA.

BRANCHES

24-26 S. SECOND STREET
HARRISBURG, PA.

119 N. MAIN STREET
WILKES-BARRE, PA.

IDEAS AND
IMPRESSIONS

COMMENT

VIEWS AND
EXPERIENCES

By F. M. COCKRELL

Tips on Taxes

Tax refrigerators? Why not? The cost of government must be borne by the thrifty people of the nation. Taxes can be collected only from those who save and accumulate wealth.

Certainly we cannot look to the improvident and wasteful portion of the public to pay taxes. They have nothing to pay with.

The presence of a refrigerator in a home is prima facie evidence that the owner has, or expects to have, more food than is actually necessary for the needs of the day.

Ownership of an electric refrigerator indicates that the householder goes in for economy in a systematic way. Isn't that a tip for the tax collector?

Saving Food

Isn't it obvious that a family which makes a regular business of saving food for tomorrow, is just the kind that is most likely to have other goods and chattels?

It is an even bet that they have money in the bank—probably a savings account. Pretty soft for the government when you find 'em with the goods on 'em.

Likely as not they own property—perhaps the home itself. Don't let it fool you if the house is not all paid for. Some mortgage company may have the deed hidden away where you can't find it.

Just look for the electric refrigerator. That is evidence enough that they have the old-fashioned idea of saving things.

Habit is a powerful force. Once people get thrifty they never know when to stop.

Three Million

Another tip! Don't stop at the high class homes. You will find those electric refrigerators in all sorts of humble cottages. Remember that about three million families have bought them.

Find those three million homes and your problem is solved. There you will find people who can depend upon—workers, savers—folks who have made this country what it is.

Don't waste your time on idlers and drifters who are here today and gone tomorrow. Go after the good substantial citizens who stick to their homes and stay put. They are the kind who buy electric refrigerators.

You can't get anything out of these wasters who fritter away their earnings on extravagances. They never have anything left over. They're broke before every pay day. You can't get blood out of a turnip, you know.

Go after the thrifty! That's the idea! Look for the people who in-

vest their money in property—things that will last and render service.

You can't go wrong with them. They are taxable. Pretty sure to be good citizens, too. The kind who vote and take an interest in the good government.

They Pay the Bills

Long suffering souls, they are. They know it is up to them to pay the bills. They realize that they must keep up the schools, the streets, and the sewers. They appreciate the police and the army and the navy because they want their homes and their property protected.

They have a wholesome respect for the office holders and politicians, also, because they know that somebody must run the government. They are too busy working and saving to do it themselves. Anyway, these people are used to paying taxes. They pay their taxes on homes, public improvements, personal property, the automobile tax, income tax, and every other kind.

They support the charities, the community funds, and come across on all of the drives whenever money is wanted. They will probably stand a little more before they rebel.

Of course, they do not expect the politicians to economize. They know how hard it is to save money, having had a lot of experience. These housewives know it means—taking care of the leftovers, buying in economical quantities and taking advantage of week-end sales, saving a little here and a little there.

They know all of these little savings count up. That's why they bought electric refrigerators.

Help the Bankers

Why, do you know that some of these housewives claim that the saving on food alone is enough to pay for the electric refrigerator? Anybody as thrifty as that ought to be a shining mark for a good assessment. Collect ten or twenty dollars apiece from all of those three million users and you will have enough money to take over some more of those bad investments made by the banks.

Goodness knows, the banks need help because they have not had much luck about saving money themselves. These thrifty housewives ought to come across and help them out.

While you are at it, there are a lot of homes which have ice boxes, several million of them. Even they must save something and ought to be good for a touch of a few dollars at least.

Yes sir, Mr. Taxman, you are on the right track when you start after the modern American home. There is the place to get the money. Pick those who save on food. Look for the electric refrigerator.

REFRIGERATOR SALES
TAX PASSED IN HOUSE

(Concluded from Page 1, Column 5) of the tax measure, but any definite prediction of its action is next to impossible.

It should be noted that the mechanical refrigerator tax applies to machines sold by manufacturers, producers or importers.

Section (A) of the refrigerator item of the bill has been quoted verbatim in the first paragraph of this story. Section (B) follows in full, these two sections making up the entire portion of the bill relating to mechanical refrigerators.

"(B). Cabinets, compressors, condensers, expansion units, absorbers and controls (hereinafter referred to as refrigerator components) for, or suitable for use as part of or with, any of the articles enumerated in subsection (A) (including in each case parts or accessories for such refrigerator components sold on or in connection therewith or with the sale thereof), except when sold as component parts of completed refrigerators or refrigeration or cooling apparatus. Under regulations prescribed by the commissioner, with the approval of the secretary, the tax under this subsection shall not apply in the case of sales of any such refrigerator components by the manufacturer, producer or importer to a manufacturer or producer of refrigerators or refrigerating or cooling apparatus.

"If any such refrigerator components are resold by such vendee otherwise than in connection with, or with the sale of, refrigerators or refrigerating or cooling apparatus, manufactured or produced by such vendee, then for the purposes of this section the vendee shall be considered the manufacturer or producer of the refrigerator components so resold."

Letters from Readers

(Concluded from Page 10, Column 4) shrinkages in the industries in which it is engaged.

The expenses of our government should be deflated and cut down in somewhat the same percentage of the deflation in industry. How can business activity possibly go forward under increased tax burden and substantially undiminished government expenditure? A 25 per cent reduction in the government budget would only go a part of the way in matching the reductions that business concerns and individuals have had to suffer universally in the United States during this depression.

Permit me as an individual to add one last word: I was a soldier in France during the World War and suffered a severe impairment of good health. I was also for many years active in the American Legion, being a co-founder of the widespread American Legion School Award movement. I do not speak therefore without sympathy for the veteran. Yet, I feel with all my heart that there should be at this time not only no thought of additional veteran beneficiary legislation, but that the whole pension and veteran relief budget should be shrunk along with every other department supported by the government. The only questionable point in such a universal program I believe should be certainly the maintenance of the Army and Navy and Aviation on the present plane of activity and probably at unreduced compensation for their personnel.

THOMAS EVANS,
President.

GORDON SMITH GENERAL
IN G. E. WAR CAMPAIGN

(Concluded from Page 1, Column 4) Page-Morris, Inc., is one of the surprises of the contest.

Merriam, competing against Rex Cole, Inc., Philip H. Harrison, Inc., Gentsch-Thompson, Inc., and other large eastern distributors, has had no difficulty retaining the title of General, bestowed upon the leading distributor in each district of the United States at the close of each week.

Other generals are L. H. Bennett, San Francisco, Pacific Coast district; S. C. Caswell, Detroit, midwestern district; C. L. McCrea, Washington, D. C., Atlantic division; W. N. Hogan, Wheeling, W. Va., central district; Frank Edwards, Salt Lake City, Utah, southwest.

KLOPP JOINS FIELD FORCE
FOR MAJESTIC

(Concluded from Page 1, Column 1) associated with the Judson C. Burns Co., Philadelphia distributor of General Electric refrigerators, as early as 1927. He was later sales manager of the General Reproductions Co., and in 1931 joined Peirce-Phelps, Inc., Philadelphia distributor for Majestic refrigerators, as manager of the resale department, which position he held at the time of his present appointment.

Westinghouse Dealers Will Use Quota
Clincher Plan; New Models Presented

(Concluded from Page 1, Column 3) educational division of the Westinghouse Electric and Mfg. Co., was chief of the Mansfield delegation.

He was assisted by Marshall Adams, formerly Westinghouse sales promotion manager, who will soon join Carl D. Taylor with the Elin Co. as retail sales manager of the Philadelphia branch of that Westinghouse distributorship; and Miss Edna I. Sparkman, Westinghouse home economics director.

The "Quota Clincher Plan," which is designed to help dealers and distributors conduct regular sales meetings, was explained by J. J. Moffatt, northwestern divisional sales promotion manager for Westinghouse.

Quota Clincher Plan

Subscribers to this plan receive: (1) a portable, pocket-size slide film projector, complete and ready for use; (2) a new slide film each month, with a guarantee of at least 50 selling ideas in the 12 films; (3) a printed guide to accompany each film, containing a prepared talk for the monthly meeting; (4) the Quota Clincher Weekly, a bulletin bringing outlines for daily sales meetings; (5) a three-ring binder for filing the monthly and weekly meeting guides; (6) from four to six volumes of the Westinghouse Salesman's Library, when and as issued.

This plan, declared by Vice President C. E. Allen to be the "greatest sales aid ever devised by our company," may be had for \$5 a month the first year. A larger projector, suitable for meetings of more than 25, is available with the remainder of the material for \$7 a month.

Education of Salesmen

Introducing this plan, Mr. Moffatt asserted that one of the most important steps in specialty selling is the education of salesmen.

"One can't depend alone on personality, past experience, and ability to talk," he maintained. "The successful salesman must observe other salesmen, must exchange experiences with them in regular conferences, must know the latest ideas emanating from headquarters."

"Every dealer should hold sales conferences for 15 minutes each morning, and for half an hour every week."

"The refrigeration picture is the fastest moving in the specialty selling field today. Men who keep up with it must read and study constantly, taking advantage of every available sales help and source of information."

Frank H. Johnson, president of the organization which was in session, opened the morning program and rung down the curtain in the evening.

Time Important—Johnson

"Time is the big hurdle in our race toward quota," observed Mr. Johnson. "We can't afford to waste a minute in getting our activities into full swing, in gaining momentum. There is little time to think about tomorrow; it's today that is important."

Every purchase we make is influenced by three things, Mr. Johnson pointed out:

1. Is there a store nearby?
 2. Does the product fit our standard of living?
 3. Have we the money to buy it?
- In choosing a location for a retail outlet, then, these factors should be considered:
1. Where are the greatest numbers of persons who can most easily reach the retail outlet for the product?
 2. Where do standards of living most favor the sale of the product?
 3. Where are the greatest numbers of persons with money enough to buy the product?

Definition of Selling

A neat definition of selling was offered by Charles Lammers, assistant merchandising manager of the Westinghouse northwestern division, who followed the definition with a slide film on the price situation, "Put Yourself in Their Place," and another slide film depicting manufacturing operations in the Westinghouse plant at Springfield, Mass. The definition of selling was:

"Selling is taking the quality out of your product and putting it in the mind of your prospect."

Marshall Adams advised all present to work and plan on the basis that 1932 is going to be a normal year—it shouldn't be compared with previous good or bad years. Normal work, normal intelligence, a normal product, and normal results will be in order, he believes.

"Hard work is today a patriotic duty," he said. "Only by labor and clear thinking can America be lifted to its former heights of prosperity."

A sales tax on electric refrigerators, he indicated, is recognition of the fact that the electric refrigeration industry is one of the most important in the United States.

In concluding Mr. Adams offered a five-point sales formula, which runs as follows:

1. Be absolutely sure that the prospect needs the service of the article you have to sell.
2. Be sure your product fills that need best.

3. Be in love with your work.
4. Always adopt an attitude of expectancy.
5. Always talk in the language of the prospect.

R. C. Cosgrove reviewed Westinghouse water cooler models, giving specifications and pointing out salient features. He was assisted by A. P. Hendry, educational director of the Frank H. Johnson Co.

Miss H. Ratcliffe, sales promotion manager of the Johnson organization, outlined direct mail and newspaper advertising campaign plans for Chicago area dealers.

Miss Edna I. Sparkman, home economics director of the Westinghouse Electric and Mfg. Co., discussed the relation of home economics and home economics workers to the salesman.

Price Situation

George F. Taubeneck, editor of ELECTRIC REFRIGERATION NEWS, talked about the present price situation in the electric refrigeration industry, called for cooperation in fighting the proposed five per cent sales tax on electric refrigerators, and did a bit of crystal-gazing into the future of the refrigeration industry.

To lighten the day's load of speeches, two playlets were staged by members of the Johnson organization.

The first, "Burying Old Man Depression," was a mock funeral conducted by the following cast:

Minister—O. C. Shuey, sales division.
Helper—A. P. Hendry, educational director.

Helper—A. S. Irvine, dealer department.

Old Man Depression—J. K. Masse, sales division.

In this playlet five sales resistances were listed:

- (1) Lack of knowledge of the product;
- (2) too few contacts;
- (3) loafing on the salesroom floor;
- (4) unplanned sales efforts; and
- (5) pessimism. Each of these was buried.

Playlets Presented

Playlet No. 2 was entitled, "How a Sale Should Not Be Made," and had for its characters these dramatic stars:

Mr. Hardhitter Salesman—A. S. Irvine, dealer department.

Mrs. Prospect—Miss H. Ratcliffe, sales promotion manager.

Mr. Prospect—A. P. Hendry, educational director.

Miss Prospect—Miss M. F. Connelly, sales promotion division.

A slide-film sequel to the playlet demonstrated how the sale should have been made.

To the assembled dealers J. J. Moffatt offered "Quota Buster" plans, and gave a detailed list of suggestions for the first half of April. These suggestions for the next eight days are as follows:

Day-by-day Program

April 7—Arrange advance "courtesy day" showings to a picked list of good prospects. Invite personally by phone or letter those prospects who you feel are really about ready to buy.

Hold "courtesy days" to show the new models. Make prospects feel that, as a special favor, you are allowing them to inspect the new Westinghouse models before they are announced to the general public.

April 9—Put Sherlock Holmes to work. Pave the way for your salesmen's calls now by sending out the Sherlock Holmes campaign. Order from your distributor in time to mail out a few days ahead of new model announcements.

April 11—Put in an "announcement type" window display with new models, on evening of April 11. It is very important that your window display between April 11 and May 1 tie up with all the national publicity being given to the new line. Use window display No. 11, ready April 1. Order from your distributor if you do not subscribe to yearly service.

April 12—Paste blow-ups of the announcement advertisement which comes out today in the Saturday Evening Post on your window. Put these blow-ups (form MGA-1690) around your display room and in your window (they are furnished no charge in reasonable quantities). Order from your distributor.

April 13—Release publicity stories on the new models to your local newspaper (suggested publicity stories can be obtained from your distributor—ask for MGA-1681).

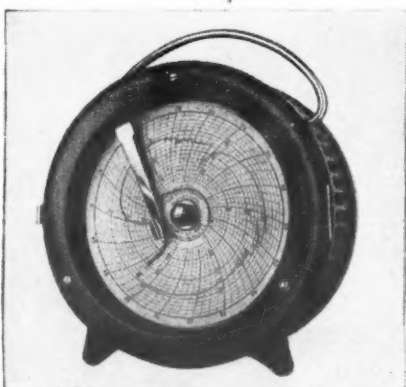
April 14—Use one-minute radio announcements over your local station. Get a copy of suggested radio shorts, MGA-1680, from your distributor.

April 15—Use novelties to induce people to visit your display room. By newspaper advertising, telephone or direct mail offer an attractive novelty to children who visit your display room accompanied by their parents or to each adult who stops in your store.

In this same connection arrange to give an attendance prize. Each person who comes to your display room should receive a number entitling him to a chance on a prize.

April 16—Have a prize drawing day. The winning number can be given a credit of \$10 or \$25 towards a new Westinghouse refrigerator.

Helps you tell, then sell



IF YOU can get the housewife's permission to let you install a BRISTOL'S Model 144 Temperature Recorder in her old-fashioned ice-box and leave it there, you can tell her what the temperature really is. There can be no argument. Model 144's continuous chart record is clear, understandable and convincing. If you then point out that leading authorities agree a temperature of 50°F is too high for the safe preservation of food, you have gone a

long way in selling her a modern electrical refrigerator.

BRISTOL'S handy little Model 144 is just the thing for giving a continuous 72 hour or 3 day chart record of refrigerator temperature. Handy. Portable. Fits in nicely between the shelves. No trouble or fuss to install. Leaflet No. 381 gives details.

THE BRISTOL COMPANY
WATERBURY CONNECTICUT

Branch Offices: Akron, Birmingham, Boston, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco

BRISTOL'S
TIME AND TEMPERATURE RECORDERS
for Refrigerators

SERVEL COMMERCIAL SALES GROUPS MEET

BIRMINGHAM, Ala.—More than 60 commercial salesmen and executives of the Alabama Power Co., Servel commercial distributor in this territory, attended the series of sales meetings conducted recently at five division points in the power company's territories.

Under the direction and with the cooperation of J. S. Sutherland, commercial sales manager of the Alabama Power Co., and his assistant, E. A. Speer, the company's regular monthly sales meetings were given over to a discussion of the Servel commercial line. Meetings were held at Birmingham, Gadsden, Decatur, Montgomery and Mobile.

Conkey, McKinney Speak

C. J. Conkey, Servel commercial sales manager of national accounts, and O. L. McKinney, district representative, were speakers on each of the five programs. Considerable time was spent at each of the meetings in explanation of the method used to determine the size machine and coil for any installation. The Servel Commercial Data Book was used as a basis for this part of the discussion.

Salesmen in Attendance

The names of those in attendance are: Birmingham: E. A. Speer, assistant commercial sales manager, Alabama Power Co.; H. Maulshead, western division manager; N. H. Eubank, W. T. Williams, E. B. Neely, district supervisors; F. G. Davis, M. L. Copeland, C. B. Cosby, Frank L. Kirby, W. D. Parker, O. A. Reed, Q. L. Coughman, salesmen.

Montgomery: S. G. Kimbrough, division supervisor; B. H. Cooper, district supervisor; B. P. Johnson, C. G. Stokes, A. C. Loftin, R. A. Braun, salesmen; J. B. Harris, service superintendent; Eugene Rowen, district supervisor; B. O. McElroy, salesman; W. W. Hunt, Manager Phoenix City; C. G. Peerman, M. A. Spinks, salesmen; O. A. Reed, Birmingham sales office; E. A. Speer.

Gadsden: C. A. Kittredge, district manager; E. A. Speer, R. M. Miller, E. V. Smith, T. H. Kennedy, salesmen; G. H. Finley, district supervisor; A. L. Ables, service supervisor; J. P. Brown, division sales supervisor; T. J. Day, B. F. Constantine, salesmen; C. G. Robertson, service; R. W. Graham, Pat Pace, salesmen; C. W. Kenyon, district supervisor; M. P. Ledbetter, general service supervisor, Alabama.

Mobile: H. E. Austin, division sales supervisor; A. E. Austin, salesman; W. D. MacLay, district supervisor; J. W. Goldsby, R. A. Girvin, George H. Leverage, H. L. Douglas, salesmen; Frank Jackson, service supervisor; E. A. Speer.

Decatur: W. F. Hall, division manager, Huntsville; Garner Price, J. W. Shealy, Hammond Wood, D. S. De'Olive, W. L. Smith, salesmen; John R. Lester, division supervisor; J. S. McClure, division superintendent; Cliff Terrell, W. E. Cliff, William Hall, salesmen; E. K. Leary, division manager; Sheffield; J. F. Ramsey, salesman; E. A. Speer.

NEW DEALERS APPOINTED BY LEONARD DISTRIBUTOR

PORTLAND, Me.—Frank M. Brown Co., Leonard distributor for Maine and northern New Hampshire, announces the following dealer outlets:

Home Radio Co., Bangor, Me.; Mikel-sky's Music Store, Bath, Me.; Wilfred J. Landry, Biddeford, Me.; Everett J. Marshall, Bethel, Me.; F. J. Gosselin & Sons, Brunswick, Me.; Neal C. Harden, Center Ossipee, N. H.; Lawry Bros., Fairfield, Me.; William W. Fish, Freeport, Me.

P. E. Ward & Co., Dover-Foxcroft, Me.; M. P. Scott, Gardiner, Me.; Norton & Harden, Kennebunk, Me.; Kittery Electrical Co., Kittery, Me.; Marcotte Music Co., Lewiston, Me.; J. W. Mitchell, Lubec, Me.; Madison Furniture Co., Madison, Me.; Charles L. Stanley, Mexico, Me.; Norridgewock Motor Co., Norridgewock, Me.

Elmer E. Stewart, North Berwick, Me.; Bailey's Music Store, Wilton, Me.; A. B. Whitehouse, Winter Harbor, Me.; O. F. Porter, Wolfeboro, N. H.; Oren Hooper's Sons and Hub Furniture Co., Portland, Me.; Hanson's Music Store, Rumford, Me.; Radio Service Co., Skowhegan, Me.

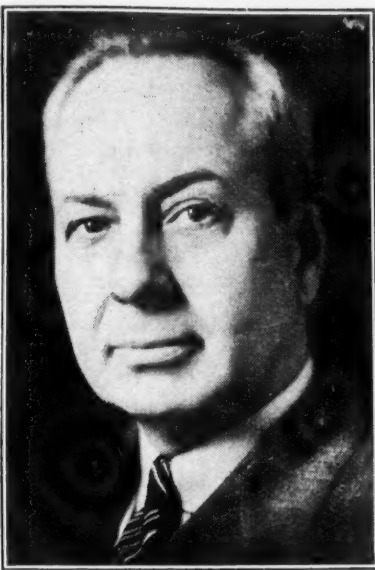
Elmer F. Walker, South Poland, Me.; Folsom Brothers, Springvale, Me.; and Atherton Furniture Co., Waterville, Me.

DR. ALLISON WILL ADDRESS NASHVILLE BUREAU

NASHVILLE, Tenn.—In response to a round-robin request signed by 10 refrigerator distributors of Nashville, Dr. G. W. Allison of the Electric Refrigeration Bureau will visit Nashville, April 15, and address the sales organizations of 12 distributing firms and 35 local dealers.

His subject will be "Trade Relations Among Electric Refrigeration Men." A local bureau will be organized at that time to cover the Middle Tennessee territory.

Joins Majestic



W. S. VIVIAN

CHICAGO—W. S. Vivian has been appointed to the refrigerator division of Grigsby-Grunow Co. to contact public utilities, according to announcement by John F. Ditzell, refrigeration sales manager.

Mr. Vivian has been until recently vice president in charge of public relations for the Middle West Utilities Co., and for 32 years has been in the fields of electric railway, telephone, and general utilities.

He conducted the first operators school for telephone operators, and was for many years the executive officer of U. S. Independent Telephone Association. During the World War he served in France as a captain in the Signal Corps, for a time having the assignment of telephone traffic chief.

He became associated with the Middle West Utilities Co. in 1923. He has served as chairman of the public speaking committee of the National Electric Light Association which developed these activities to more than 30,000 talks per year.

WARD NAMED WHOLESALE HEAD OF MAINE FRIGIDAIRE

PORTLAND, Me.—William B. Ward, Jr., formerly manager of the Portland branch of Frigidaire Sales Corp. of New England, has been named assistant wholesale manager, with control of the business in Maine and northern New Hampshire.

He has announced the following promotions: Herbert B. Baldwin, Portland, in charge of engineering for Maine; Alan C. Miller, formerly of Augusta, in charge of commercial sales; Arthur S. Day, Portland, household refrigeration manager.

Raymond W. Penfield, dealer supervisor for central and northern Maine; Guy P. Clement of South Portland, district supervisor of "B" dealers in central and western Maine; Francis Powers of Portland, manager of parts control department; Miss Mabel C. Nelson, office and credit manager.

200 OHIO PUBLIC UTILITY SALESMEN ATTEND MEETING

MANSFIELD, Ohio—More than 200 distributors, dealers, salesmen, and utility men were guests of the Ohio Public Service Co. at a meeting in the Mansfield Leland Hotel recently, to hear a program arranged by C. L. Dunn, state Electric Refrigeration Bureau chairman.

Addresses were made by C. E. Allen and C. B. Graves of Westinghouse; Art Scaife of General Electric; H. H. Kennedy of Frigidaire, and C. H. Vaughn and C. O. Kennedy of Ohio Public Service.

Maj. C. B. Wilcox, G. E. Snider, P. V. Fraser, and M. W. Thernes, all of Ohio Public Service Co., also spoke.

Dr. G. W. Allison, field manager of the Electric Refrigeration Bureau, spoke at the dinner session on trade relations among refrigeration men.

Representatives were present from Mansfield, Warren, Elyria, Alliance, Ashland, Sandusky, and Port Clinton.

Dr. Allison spoke at meetings in youngstown, Alliance, Sandusky, and Dayton last week.

YOUNG APPOINTED BINDER SALES MANAGER

NEWARK—C. W. Young, formerly with Frigidaire Sales Corp., has been appointed retail commercial manager of Binder Distributing Co., Copeland distributor in New Jersey.

While with Frigidaire, Mr. Young's outstanding sale was that of air conditioning equipment for the home of the late Thomas A. Edison.

The Binder Distributing Co. announces a 92 per cent increase in commercial sales in 1931 over 1930.

MERCHANDISE GIVEN WITH SALE OF UNIT

MONTGOMERY, Ala.—Awarding of free merchandise with each purchase of an electric refrigerator is being used as a merchandising scheme by the Mathews Refrigerating Co., Kelvinator dealer, and the National Furniture Store, handling Norge.

The Kelvinator dealer's list of merchandise starts with a four-burner 16-in. oven gas stove with each purchase. These stoves are said to have a value of \$50.

If the customer has a gas range, then she is given the choice of additional merchandise consisting of a Hoffman water heater, gas heater, or radio with a value of \$50.

Advertising Tie-up

In addition, the Mathews firm is effecting a tie-up with local merchants so that electric refrigeration purchasers also receive the following: a suit cleaned and pressed; a layer cake; a marcel; a week-end cake; 100 calling cards; a dozen pieces of candy; a pound of chicken salad.

A hat cleaned and blocked, a pair of shoes half soled and heeled; one pound of coffee; a half-pint of mayonnaise; a can of cleanser; a tire repair job; a hair cut, shave and shine; a 3-lb. sack of meal; two theatre passes, six bottles of Coca-Cola, and a 50-cent dinner.

The merchants donating this merchandise receive free publicity and advertising in the newspapers and in the Kelvinator showroom.

The National Furniture Store is offering gifts of groceries, silverware, a 50-piece dinner set and a 7-piece linen table set with each Norge bought.

SALES CONFERENCES HELD BY MAJESTIC DISTRIBUTOR

CHICAGO—Meetings to announce the new Majestic refrigerator line and the new prices are being held by the Harry Alter Co., distributor here.

Dealers met recently in the Gold ballroom of the Congress Hotel, where the Majestic line was introduced by Harry Alter and his brother, Arthur Alter.

W. G. Peirce, assistant to Don Compton, Majestic vice president, talked on the development of the new standard line, and J. F. Ditzell, sales manager of the Grigsby-Grunow Co., discussed the marketing of electric refrigerators at prices which can be met by the average family.

SERVEL OFFERS PRIZE FOR INTERESTING SALES STORY

EVANSVILLE, Ind.—A "Best Sales Story of the Month" contest has been announced through the pages of Servel's official house magazine, "Simplified Refrigeration," offering a cash prize for the most interesting and unusual sales story submitted by a Servel salesman each month.

The March issue carries a prize-winning story by E. I. Bates of the Suburban Electrical Appliance Co., Servel distributor in the Western Springs, Ill., territory.

Rules of the contest state that the story should relate an experience "in which the salesman put over a 'tough one' that required some special selling tactics, either in the face of competition, because of some peculiarity of the prospect, or some other unusual situation that required something more than producing an order blank and having it signed with little effort on the part of the salesman."

SALESMAN SELLS 32 UNITS IN 6-DAY PERIOD

MILWAUKEE—Thirty-two Kelvinators in six days is the record of William Walker, salesman for the Milwaukee Electric Railway & Light Co.

The period was that between March 7 and March 12. Monday, March 7, Mr. Walker made one sale; the next day two sales; then 5, 7, 9, and 8 on the succeeding days.

Mr. Walker has been with Milwaukee Electric Railway & Light Co. since Jan. 18, but has since been sick in a hospital for two weeks. He has sold a total of 59 Kelvinators.

HARVARD COLLEGE BUYS REFRIGERATION UNITS

CAMBRIDGE, Mass.—Harvard College Observatory has just completed its new Astrophotographic building, which will house 800,000 photographs of the heavens in its fireproof vaults for permanent protection. This is the greatest collection of photographic plates of the heavens in existence.

Among the equipment for developing plates in this building are a small Seeger refrigerator and Copeland AM condensing unit in the developing room, as well as a Copeland Filtrine Cooler to prepare chilled water in the developing process.

13 G. E. Specialists Aid Dealers

CLEVELAND—Thirteen trained sales specialists, equipped with charts, slide films, and sales ammunition, have been sent by General Electric refrigeration department into all parts of the United States to work with distributors, utility outlets, and dealers.

The specialists include M. F. Mahony, manager of the merchandising division; G. C. Wasson, manager of the distribution division; A. A. Uhalt, manager of the dealer division; his assistant, F. W. Chandler; Ralph Cameron, A. L. Scaife, Jean DeJen, all of the merchandising division.

J. M. Walker and Harry Kumler of the central station division; A. R. Green, product division; R. C. Shaw, sales promotion division, and M. J. Young and G. D. Kobick, apartment house specialists.

These men will work with the following district representatives in their respective sections of the United States: Fred T. Harvey, T. B. Allen, R. H. Ferguson, Ben C. Ritter, George J. Ruck, A. E. Freshman, and B. M. Walthall.

MYERS, FORMER FRIGIDAIRE PERSONNEL HEAD, DIES

ALLIANCE, Ohio—Harry M. Myers, formerly director of personnel of Frigidaire Corp., died here, March 20. He left Frigidaire Corp. in 1930 to devote his time to writing and lecturing, and was the author of a recent book called "Human Engineering."

Before his connection with Frigidaire, he was medical director of the Ohio Brass Co., Mansfield, Ohio, for six years, and later associated with the Dayton Malleable Iron Co.

DEALER SECURES 40 PROSPECTS IN TIE-UP

DENVER—More than 40 "live" prospects, a number of whom have already become buyers, were secured by the Winter-Weiss Co., Denver Servel dealer, in a recent advertising tie-up with the Denver Post recipe contest.

During the contest Winter-Weiss Co. offered a credit of \$25 on a new machine to the first prize winner in each week's recipe competition, and credits of \$10 to all other prize winners. This advertisement was run on the recipe contest page.

Offer Prizes for Leads

The copy also offered a useful kitchen article to any woman who would send the firm the names of two friends who did not own electric refrigerators.

The 1932 Servel model was pictured in the advertisement. The same copy later appeared in a book of prize recipes put out by the Post. The original issue of the book was 10,000 copies, having distribution in all of the Rocky Mountain region. At least one more edition will be published.

The souvenir given was a combination spoon for handling hot foods. These utensils cost 19 cents each. More than 20 women each sent in the names of two refrigerator prospects to receive these gifts. A number of the women were themselves good prospects.

Expect 100% Return

Officials of Winter-Weiss Co. report that a good proportion of the credits presented prize winners in the recipe contest have already been redeemed, and that they expect a 100 per cent return on this phase of the program.

Prospects living in Denver were followed up by personal calls by salesmen and out-of-town prospects were solicited by letter.

TWO MEN and a LAR-MAC CARRIER



FROM sales floor to truck . . . from truck to pantry . . . up the steps and through the home, right to its station of service goes the biggest, bulkiest, heaviest household appliance. With equal ease and safety the obsolete refrigerator is swiftly removed.

Two men did it—just two—with the help of a Lar-mac Carrier. They didn't injure themselves. Nor the new refrigerator. Nor the customer's floors. They pleased both employer and customer.

That's the splendid thing about the Lar-mac. It has a long, sturdy frame with special skis to aid the rubber-tired, ball-bearing rollers. Also an adjustable front guard which fits many other heavy appliances. The object rests on a thick pad. And clenching it with the tenacity of an octopus is a strong, webbed strap.

Hundreds of Lar-macs are already in use; and hundreds of praises sung in their favor. They're the best good-will builders you can possess. Write today for the booklet called "You Can Reduce Delivery Expense." It explains Lar-mac speed and safety.

Price \$32.50 F. O. B. Dayton

Lar-mac
TRADE MARK REGISTERED

THE LAR-MAC COMPANY

220-223 Mutual Home Building

Dayton, Ohio

Copyright Lar-Mac Co.

How To Operate a Distributorship

As Told by H. A. Abrahamson, Detroit Majestic Products Corp.

By Phil B. Redeker

DETROIT—When the Detroit Majestic Products Corp., distributor of Majestic refrigerators and radios for the state of Michigan holds its spring sales meeting, here, April 7, part of the activities will be given over to the celebration of the company's Golden Jubilee as a specialty merchandising house in Detroit.

If the 50 years of merchandising background have taught one salient factor to the present leaders of the organization, President H. A. Abrahamson, Vice President J. J. Wood, and Secretary-Treasurer R. R. Abrahamson, it is that a selling organization must be complete to be effective.

Complete Sales Set-up

So it is that this Majestic-selling outfit is characteristically complete in its set-up, with its trained wholesale representatives throughout the state, its hard-canvassing retail salesmen in Detroit proper, and a service department which extends its operations to dealers.

H. A. Abrahamson is a distributor who believes in expansion. He has dealers in most of the important cities throughout the state—and he's on an ever-constant search for more outlets.

He has created almost overnight a selling organization of 40 salesmen, four supervisors, and a sales manager to handle retail selling activities in the four counties of the Detroit area—Wayne, Oakland, Macomb, Wastewaw, and Jackson.

Plan New Quarters

At the present time the Detroit Majestic Products Corp. is planning to move into newer and larger quarters.

Eleven trained men carry on the wholesale sales work throughout the state. These men aid the dealer in carrying on campaigns and in putting out promotional literature, and, if necessary, they will help in closing sales.

Two branch offices and warehouses,

one at Grand Rapids and the other at Saginaw, facilitate the operation of the wholesale representatives.

In addition to the 11 representatives throughout the state, there are two wholesale salesmen working with dealers in the Detroit area.

Retail domestic operations in Detroit are under the direction of L. E. Hodges, sales manager.

Experienced men have been preferred in the selection of retail salesmen, Mr. Abrahamson points out.

Ability to 'Close' Important

"Ability to 'close' sales is the factor that makes a good salesman," Abrahamson asserts. "Almost every salesman can get a prospect interested in the product, but only the few that can get the customer to sign on the dotted line are really successful salesmen. Some make their story too long; others cut it too short. The quality of being able to close is more or less in the nature of a 'knack' for the type of work, although it can be built up."

"When a man establishes himself as having had a career of some length of time as a salesman, it is evidence that he was able to close sales at one time or another."

However, the average former radio salesman rarely makes a good refrigerator salesman, the Majestic distributor points out.

Radio Too Easy to Sell

"Radio was too easy to sell," he points out. "Then there is the matter of difference in the prospect's wants as represented by the two products. Radio is a luxury piece of merchandise, while the refrigerator prospect is usually thinking in the terms of economy and service as well as convenience."

Refrigerator salesmen don't handle radios, and vice versa, in the Detroit Majestic Products Corp. organization.

The refrigerator division is separated even to the extent of having its own headquarters.

Salesmen who handle radios and washing machines cooperate with the refrigeration division, however, by giving them tips on prospects whom they stumble across.

The 40 retail salesmen work under the direction of four supervisors. Each supervisor is responsible for the coverage of a certain piece of territory in the area covered by the retail operations.

There is no separate apartment house division. The supervisors are responsible for the apartment house business in their territory.

In the refrigeration sales headquarters is a classroom in which salesmen

are given instruction from time to time. Under the direction of J. H. Shinberg, a highly efficient service department has been built up to handle refrigeration.

In addition to taking care of service calls in the Detroit area, the department functions as a training course for dealers.

Dealers are trained to do their servicing in two ways. They come in to service schools conducted at the home office, and also receive training from service directors sent out into the field.

Direct canvassing is advocated as the most effective method of getting prospects; advantage is taken of the clientele that attends public shows, names of some 27,000 prospects being gathered through a "write-your-name-on-a-card" prize drawing conducted at the recent Detroit Builders' and Food Show.

Supervisors on Salary

Supervisors get a regular salary as well as a commission. In turn, they are responsible for a certain amount of business from their territory.

"You can see that they have plenty of incentive for hard work and intelligent direction," Abrahamson smiles.

Salesmen are paid on a straight commission, and are entitled to a 2 per cent bonus if they attain a certain standard fixed volume of business.

Mr. Abrahamson believes that contests with suitable prizes are great aids as stimulants to salesmen, and intends to launch upon a series of such contests within the next few months.

Use of Direct Mail

The prospect uncovered by a Detroit Majestic Products Corp. salesman is seldom allowed to forget that he is a prospect for a Majestic refrigerator, as both a series of direct mail literature and a telephone campaign keep him conscious of the Majestic line.

Mr. Abrahamson is using newspaper and billboard advertising to promote the sale of refrigerators, and intends to use radio broadcasts in the near future.

"Our newspaper copy is practically all direct appeal stuff," he states. "Price, the need for refrigeration, and the conveniences it offers are the principal points stressed."

"Our radio broadcasts will tend to be more on the institutional type of advertising and publicity."

Dealers who wish to do advertising are aided by the distributing organization on a 50-50 basis. The extent to which the main organization will go on such a scheme depends entirely upon the estimate which they place on the dealer's ability and enthusiasm, Mr. Abrahamson avers.

HOME ECONOMIST SPEAKS AT SERVEL CONFERENCE

LOS ANGELES—Serval Hermetic dealers of the H. R. Curtiss Co., Serval distributor in this territory, attended the spring sales conference held recently at the distributing firm's retail headquarters in this city.

Kate Brew Vaughn, head of the home economics department of the Los Angeles Herald and Express, gave an interesting talk on electric refrigeration from the woman's viewpoint.

At a recent luncheon, she explained, the question was asked 180 women as to how many were still using ice. One hundred and sixty-five of them raised their hands, she said, which shows the potential possibilities in the field of refrigerator sales.

Miss Vaughn cautioned against selling ice cream freezing instead of refrigeration, which should be sold, explaining that ice cream freezing was beside the point, and from her own experience she had found too many salesmen making a sales talk on ice cream freezing rather than on proper refrigeration for the home.

Harry Curtiss of the H. R. Curtiss Co., spoke on the opportunities in the electric refrigeration field for the dealer who went after the business.

W. T. Wyatt, Serval West Coast factory representative, also was a speaker on the evening program.

COPELAND DISTRIBUTOR MOVES HEADQUARTERS

BOSTON—The Appliance Engineering Co., Copeland distributor for New England, has moved into its new building at 701 Beacon St., occupying the entire three-story space.

Each floor of the new building has an area of 3,000 sq. ft. The showroom is located on the street floor, with a parts department in the rear, separated from the rest of the room by a partition.

The second floor contains general offices, mailing department, and commercial display room. Third floor is used as the service department and for storage. An eight-car garage is located in the basement.

Leonard Distributor Names Dealers

BRIDGEPORT, Conn.—The D'Elia Electric Co., Leonard electric refrigerator distributor for Connecticut, has secured 15 retail outlets in 14 Connecticut cities and towns during the first few weeks of its initial campaign, according to William DeRosa, secretary.

The dealers are: Watson's, Inc., 1174 E. Main St., Bridgeport; Lincoln Hardware Co., 1287 Stratford Ave., Bridgeport; Dube Electric Co., 30 Bank St., New Milford; Sterling Furniture Co., 42 N. Main St., South Norwalk; G. E. Keith Furniture Co., 1150 Main St., South Manchester.

J. Harold Sanford, Redding Ridge; Arthur O. Kamens, Terryville; George T. Bachand, 28 Judd St., Bristol; Hugo L. Bohlin, 96 Water St., Naugatuck.

Stuart Craft, 12 N. Main St., Southington; Gigliotti Bros., 91-93 White St., Danbury; Ansonia Furniture Co., 200 Main St., Ansonia, and the three stores of McCoy's, Inc., at 158 Grand St., Waterbury; 89 Asylum St., Hartford, and 40 Water St., Torrington.

G. E. HOME ECONOMIST TO AID PRUDENCE PENNY

LOS ANGELES—Miss Alice Robertson, director of the home service department for the George Belsey Co., Ltd., distributor here for General Electric refrigerators, has recently assumed the role of consultant in conjunction with the activities of Prudence Penny, who recently opened a test kitchen for the Los Angeles Examiner.

The test kitchen is not used for demonstration, but for trying out new recipes. Hundreds of women have brought and are continuing to bring cooking problems to the test kitchen where Prudence Penny and Miss Robertson discuss them.

On regular consultation days Miss Robertson is on hand to answer over the radio questions regarding electric refrigerators. The George Belsey Co.'s home service director was the guest of honor at the formal opening of the test kitchen. Prudence Penny uses a General Electric refrigerator in making many tests.

BUYER'S GUIDE

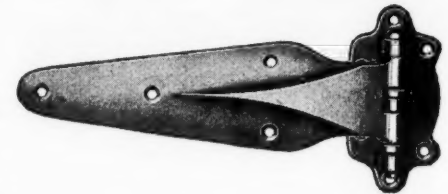
Manufacturers Specializing in Service to the Refrigeration Industry

SPECIAL ADVERTISING RATE (this column only)—\$12.00 per space. Payment is required monthly in advance to obtain this special low rate. Minimum Contract for this column—13 insertions in consecutive issues. All advertisements set in uniform style of type with standard border. Half-tone engravings of 100-line screen, either outline or square finish. No reverse cuts or heavy black effects. No charge for composition.

KASON HINGES

NEW!

Pat. Des. No. 85477
Other Patents Pending



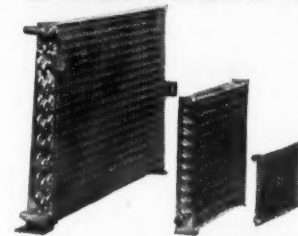
Send for Samples on Approval

Kason Hardware Corp., 61-67 Navy St., Brooklyn, N.Y.

FLINTLOCK CONDENSERS

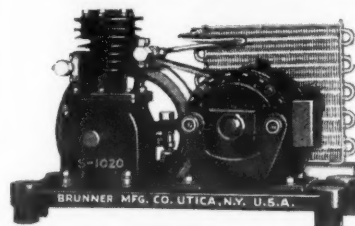
FOR EXTRA CAPACITY WITH GREATER EFFICIENCY

Used as standard equipment by over 65% of the leading electric refrigerator manufacturers.



FLINTLOCK CORPORATION
4461 WEST JEFFERSON DETROIT, MICHIGAN

RUGGED RELIABILITY



Brunner Units are ruggedly built to render long and silent service with comparative freedom from repair costs. Get the complete Brunner story. It contains convincing facts on Brunner's ability to back its claims with performance records.

HIGH SIDES and COMPRESSORS by BRUNNER

The Lowest Priced Refrigerator Trucks on the Market!

FINDLAY REFRIGERATOR TRUCKS

The only practical trucks at this unheard of price level. Save one man on deliveries. Make heavy lifting easy—quick. Eliminate damage to cabinets—floors—walls. Fit all cabinets with legs. All-steel frame. 4" rubber tired wheels. Only pads touch cabinet. Sturdy construction. Satisfaction guaranteed. Complete set \$18

The equal of refrigerator moving equipment that costs \$10.00 more.

Manufacturers of Trucks for 32 Years

Self-Lifting Piano Truck Co. - - Findlay, Ohio

BARE COMPRESSORS

New 1/6 H. P. Twin 1 1/4" x 1 1/4"

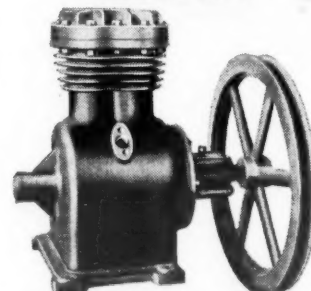
For Sulphur Dioxide or Methyl Chloride

Other Sizes 1/6 H. P. to 50 H. P.

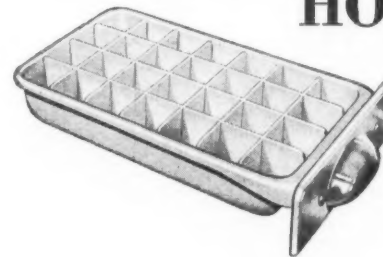
"PARKER" Refrigeration Since 1899

H. C. PARKER, LTD.

2600 Santa Fe Ave. (Factory), Los Angeles, California
510 Larkin Street, San Francisco, California
437 Montgomery Street, Jersey City, New Jersey



HOOSIER PARTS



Complete—Assembled—Packaged—Ready for shipment in your Refrigerator. Typical 28-cube tray shown is aluminum with patented Alumilite Anodic treatment and chrome plated handle—size overall 5 11/16" wide by 10 1/4" long by 1 5/8" deep with 6 7/16" x 1 15/16" Handle. Many other sizes and styles. Write for details.

Dessert Trays—Defrosting Pans

HOOSIER LAMP & STAMPING CO., EVANSVILLE, IND.

YOUR ADVERTISEMENT

in this Buyer's Guide Column will be seen by distributors, dealers and refrigerator manufacturers throughout the entire world.

SPECIAL LOW RATES

make it easy to keep industry buyers constantly informed of your products and service.

Electric Refrigeration News

550 Maccabees Bldg. Detroit, Mich.

Fulco
Refrigerator
COVERS

Insure deliveries without scratched or broken enamel. Write for prices.

Fulton Bag & Cotton Mills

Dealers! You need these
Finest Quality Enamel.
PRICES RIGHT.
orders filled promptly.

875 DOZ. 450 1/2

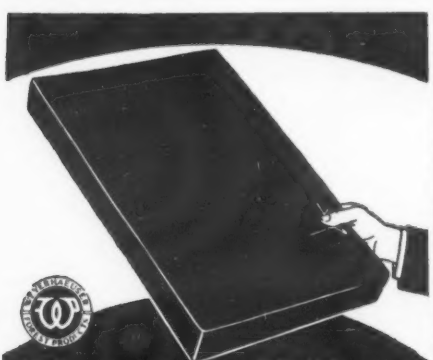
Mastercraft Refrigerator Pad and Carrying Harness



The Mastercraft Pad and Carrying Harness are adjustable to all sizes refrigerators to 11 cubic feet capacity. They are sturdy, convenient and inexpensive. Recommended by all leading manufacturers. Pads attractively lettered with refrigerator name.

Write for special pad booklet

BEARSE MANUFACTURING CO.
3815-3825 CORTLAND ST. CHICAGO, ILL.



Balsam-Wool
Sealed Slabs
EFFICIENT
PERMANENT
Completely satisfactory
Refrigerator Insulation

WOOD CONVERSION COMPANY
Industrial Sales Offices:
CHICAGO, 360 N. MICHIGAN AVE.
New York, 3107 Chanin Bldg.
Detroit, 515 Stephenson Bldg.
San Francisco, 149 California St.



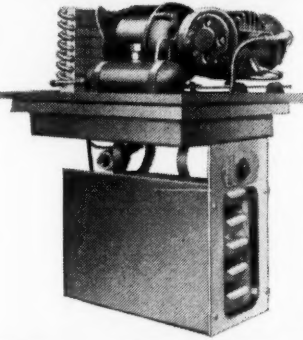
Electrical Refrigeration Parts and Supplies

We Carry in Stock:

COMPRESSORS—EVAPORATORS—THERMOSTATS—VALVES AND FITTINGS—THERMOSTATIC AND AUTOMATIC EXPANSION VALVES—COPPER TUBING—CONTROLS—AND MANY OTHER PARTS

Melchior, Armstrong, Dessau Co.

116 Broad Street, Telephone Bowling Green 9-8870, New York, N.Y.

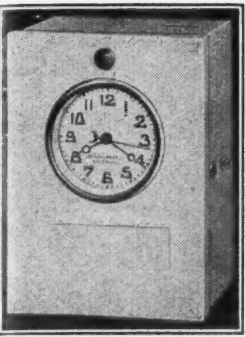


SURECOLD

New Top Drop-In Unit

Only three moving parts. Double shaft seal; rings on pistons; Reed valves; 1/5 h.p. motor; finger tip control; 3 to 7 ice trays. Designed to give long-time, trouble-free refrigeration. Here's what quantity buyers wishing a good product have been wanting.

The Warner Steel Products Co.
Ottawa, Kans., U.S.A.



Sell your line of refrigerators the LEKTROMETER Way

On the 25c a day plan, do away with price cutting, equipped with a Self Starting New Haven Westinghouse Electric Clock and exclusive features to be found only in the LEKTROMETER such as tell-tale jewel and defrosting switch.

Write for Our Sales Volume Builder

SHAY-WEST AND ASSOCIATES
616 S. Michigan Ave., Chicago

Fruit & Vegetable Baskets Mechanical Springs Wire Food Shelves

We give prompt service and excellent workmanship.
Send us your inquiries.

L. A. YOUNG SPRING & WIRE CORP.
9200 Russell St. Detroit, Mich.

A big waiting market for Commercial Refrigeration Equipment BOTTLE COOLERS

Five Models for Your Commercial Compressor Units
NOW is the season to "cash in" on this sure market

Ask for Catalogue

S & S PRODUCTS CO. LIMA, OHIO
Exclusively Bottle Cooler Manufacturers

SUBSCRIPTION ORDER

Business News Publishing Co.,
550 Maccabees Bldg.,
Detroit, Mich.

Sirs: Please enter order for subscriptions as follows:

- ☐ ELECTRIC REFRIGERATION NEWS only ☐ 1 year ☐ 2 years.
☐ REFRIGERATED FOOD NEWS only ☐ 1 year ☐ 2 years.
☐ ELECTRIC REFRIGERATION NEWS and REFRIGERATED FOOD NEWS.
Combination rate for both papers ☐ 1 year ☐ 2 years.
☐ 1932 REFRIGERATION DIRECTORY, \$2.00 per copy.

SUBSCRIPTION RATES (Effective Jan. 1, 1932)	Electric Refrigeration News		Refrigerated Food News		BOTH PAPERS	
	1 Yr.	2 Yrs.	1 Yr.	2 Yrs.	1 Yr.	2 Yrs.
In United States and Possessions and all countries in Pan-American Postal Union	\$3.00	\$5.00	\$1.00	\$1.50	\$3.50	\$6.00
In Canada (where new tariff of 5 cents per copy applies). Payment in U. S. money.	\$6.00		\$2.00		\$7.00	
All other countries	\$4.00	\$7.00	\$1.50	\$2.50	\$5.00	\$9.00

Name

Attention of or care of.....

Street address

City and state.....

4-6-32

REQUESTS FOR INFORMATION

Please refer to the 1932 Refrigeration Directory and Market Data Book for a complete list of all manufacturers of refrigeration equipment, parts, materials, supplies and accessories; also for all available statistical data on sales of refrigeration equipment, distribution methods, etc.

To obtain a copy of this book send \$2.00 to Business News Pub. Co., 550 Maccabees Bldg., Detroit, Mich.

Advertisers will be given preference in published answers to requests for buyer's guide service, but a complete list of all known suppliers will be mailed if stamped, self-addressed envelope is enclosed with inquiry.

Readers who can be of assistance in furnishing correct answers to inquiries, or who can supply additional information, are invited to address Electric Refrigeration News, mentioning query number.

Quick-freezing Equipment

Query No. 715—"Several months ago you published a list of companies that manufacture quick-freezing equipment. We had such a list, but it has been mislaid and we would like to obtain a duplicate."

Answer—See REFRIGERATED FOOD NEWS, Nov. 1, 1931, or the 1932 REFRIGERATION DIRECTORY and MARKET DATA BOOK, page 28.

Dehumidifying Storage Rooms

Query No. 716—"For some time I have had in my residence a cold storage room about 6x7x8 ft., equipped with a Frigidaire system, but am having a great deal of trouble with my fruit molding.

"What can I use in the room to reduce the relative humidity by absorbing the moisture? I presume that it would have to be dried out occasionally over a stove."

Answer—The most economical method in use is to remove moisture in the air with calcium chloride. Communicate with S. B. Heath, development engineer for the Dow Chemical Co., Midland, Mich.

Cabinet Hinges

Query No. 717—"Where can we buy hinges for our new ice cream freezer?"

Answer—Kason Hardware Corp., 61 Navy St., Brooklyn, N. Y.

Ice Cream Freezer Castings

Query No. 718—"We are manufacturing a new ice cream freezer and cooling cabinet. We have had difficulty in securing suitable castings that are not too porous, and that will not tarnish or taint milk. The casting we now have is made of Durbin metal, and is so hard that machining and polishing is quite expensive. It stands up otherwise. Do you know where we can get a suitable casting?"

Replacement Parts

Query No. 719—"We (a western firm) are interested in buying replacement parts in the East."

Answer—Communicate directly with manufacturers of the machines being serviced, or with the following organizations which specialize in the supply of replacement parts: Home Appliance Service Co., Inc., 714 W. Market St., Greensboro, N. C.; Iceless Refrigeration Accessories Co., 2401 Chestnut St., Philadelphia; Refrigeration Service, Inc., 3109 Beverly Blvd., Los Angeles; or Tigar Corp., 211 Second St., Chelsea, Mass.

Heating and Cooling Units

Query No. 720—"Please send me a list of manufacturers of combined heating and cooling units, or of companies supplying both heating and cooling units."

Answer—Frigidaire Corp., Dayton, supplies an air conditioner which offers both heating and cooling.

Twin Cylinder Compressors

Query No. 721—"I have been advised to write to you for sources of supply for twin cylinder compressors for electric refrigerators; please send me such a list."

Answer—See 1932 REFRIGERATION DIRECTORY and MARKET DATA BOOK, page 321.

Exports to the British Isles

Query No. 722—"Where can we secure a record of export shipments to the British Isles in total units and dollar value during 1931, and if possible for the first quarter of 1932?"

Answer—Complete data on export shipments of refrigeration equipment by years and by countries since 1926 appears in the 1932 REFRIGERATION DIRECTORY and MARKET DATA BOOK.

COMMONWEALTH & SOUTHERN OFFICIALS VISIT PLANT

DETROIT—L. R. Parker, general merchandise manager of the Commonwealth & Southern Corp., New York City, spent a day at Kelvinator Corp. headquarters, here, last week.

Mr. Parker was the guest of Campbell Wood, Kelvinator director of utility sales, and the two men returned to New York together.

MAJESTIC FIELD MAN FOR WEST APPOINTED

CHICAGO—The appointment of Jacques Tyrol as sales representative of the Grigsby-Grunow Co. in the Pacific Coast district has been announced by Majestic officials here. Mr. Tyrol will cover California, Washington, Oregon, Nevada, and Arizona.

Mr. Tyrol has had refrigeration experience with Frigidaire Corp. in the early days "when he had to tell his prospects that his product was an electric refrigerator, and not a breakfast food." He was later educational director, sales promotion manager, and employment director of the Pasadena Frigidaire branch.

Previous to his connection with Frigidaire Corp., he was an actor, play director, newspaper man, and linguist. Several years were spent in the motion picture industry as a director, organizer, and officer in various firms.

Born the son of a family famous in the annals of Italy and Austria, he dropped his family name and legalized his nom de plume, becoming plain Jacques Tyrol.

He was trained and educated for government service, his early schooling including psychology, philosophy and languages, first in Italy, then in Germany. He speaks 16 languages, and holds decorations for his work on the stage in Europe before various royal personages.

It was through his work as a newspaper correspondent that Mr. Tyrol was brought to America, where he "was so charmed by the democracy" that he became a citizen.

9 REFRIGERATION MAKES SHOWN IN DETROIT STORE

DETROIT—Distributors of nine makes of refrigerators are cooperating this week with the J. L. Hudson Co., Detroit's largest department store, in its annual spring refrigeration show which occupies a considerable part of the tenth floor of the Hudson store on Woodward Ave.

The distributors furnished the boxes, while the department store refrigeration section set up the exhibits, lighting and ice cream serving equipment.

Four hostesses are in constant attendance at the show, making desserts in the refrigerators and serving them to the women. They also give advice on how to use the refrigerator.

A number of the Hudson Co. floor salesmen are in attendance to talk to any of the women who appear to be interested in the purchase of a refrigerator.

Thousands of invitations have been mailed to prospects gathered both by the department store and the distributors.

The following makes of refrigerators are represented at the show:

Copeland, Leonard, General Electric, Frigidaire, Norge, Kelvinator, Westinghouse, Apex and Electrolux.

ELECTRICAL ROBOT CENTER OF G. E. WINDOW DISPLAY

LITTLE ROCK, Ark.—"Mr. Kilo-Watt," an electrical robot designed by K. D. Andrews of this city, has been a feature of window displays of the Arkansas Power & Light Co., outlet for General Electric refrigerators.

Through the use of a photo-electric cell, Kilo-Watt sets in motion a number of electrical appliances at the command of any person through the medium of a whistle or flashlight ray. Three short flashes of the light will start the refrigerator, and another signal will stop it. Other signals will start other appliances.

Kilo-Watt has still another trick, that of smoking a cigaret.

Another feature of the display in which he appeared is a meter calibrated in cents instead of watts. When an appliance is turned on, the meter shows just what it costs per hour for operation.

Kilo-Watt made appearances in branches of the Arkansas Power & Light Co. at Pine Bluff, Searcy, Batesville, and has been displayed before groups of Kiwanians, Rotarians, and other civic organizations.

SERVEL OFFICIALS SPEAK AT DISTRIBUTOR MEETING

CINCINNATI—The Griffith-Victor Distributing Corp., distributor of Servel refrigerators, held its second annual Servel convention and banquet at the Gibson Hotel, recently, according to C. W. Hyde, who was in charge.

C. C. Olin of the engineering department; W. Paul Jones, advertising manager, and A. C. Miller, sales manager, were speakers at the meeting. A line of Thor washers and Ironers and Victor radios was on display, in addition to the 1932 Servel line.

Nearly 100 dealers and distributors were present at the convention and banquet.

THE CONDENSER

PAYMENT IN ADVANCE is required for advertising in this column. The following rates apply:

POSITIONS WANTED—Fifty words or less, one insertion \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each. ALL OTHER CLASSIFICATIONS—Fifty words or less, one insertion \$3.00, additional words six cents each. Three insertions \$8.00, additional words sixteen cents each.

REPLIES to advertisements with box numbers should be addressed to the box number in care of Electric Refrigeration News, 550 Maccabees Building, Detroit, Mich.

POSITIONS AVAILABLE

ESTABLISHED manufacturer of Domestic and Commercial Refrigerating Machines and Cabinets has opening for an Assistant Chief Engineer. Only men with college education and at least five years' experience in the refrigeration industry will receive consideration. Give complete outline of past experience, references and education in first reply. Box 441.

POSITIONS WANTED

REFRIGERATION MERCHANDISING EXECUTIVE, connected with industry seven years. Specialist department store, dealer and direct merchandising desires connection substantial company as sales manager, district or branch manager. Unusually high past performance, record as producer and excellent character record. Remuneration secondary to stability of connection. Box 432.

SERVICE MANAGER—PRACTICAL—desires new connection with distributor of commercial and domestic electric refrigerator. Can assume full charge of installation, service and shop and produce results. Eight years diversified experience with all kinds of field problems coupled with first class references, are main qualifications. Box 435.

COMMERCIAL SALES MANAGER with six years' experience in refrigeration sales development and promotional work wants connection with manufacturer who desires more commercial refrigeration business. Thoroughly familiar all types commercial markets including frozen foods, truck refrigeration and air conditioning. References and records of performance furnished on request. Write Box 436.

REFRIGERATION expert, 14 years' experience in engineering and development work on domestic and commercial equipment, accessories and production methods. College graduate. References. Available for position as chief or consulting engineer to manufacturer in need of results. Box 437.

SERVICE MANAGER, graduate engineer, qualified by education and experience to handle refrigeration service department economically and efficiently and engineering of commercial installations desires connection with manufacturer, distributor, or dealer. Age 31. Five years in installation, servicing, and engineering. Box 438.

FOREIGN service or U. S. position desired by young American experienced with household equipment. Proven sales and executive ability, college training, pleasing personality. Willing to travel. Formerly managing director large British firm in Buenos Aires. Familiar French and Spanish. Good connections in U. S., western Europe, southern and central America. Box 439.

TO MANUFACTURERS who contemplate entering refrigeration field, there is offered the combined talents of three designers who possess necessary background in domestic compression and absorption types, cabinets and commercial display cases, mechanical and dry ice motor truck refrigeration. Box 440.

GAGE AND INSTRUMENT MAN specializing on gage design and inspection methods for high speed production; gage-room systems; tool-inspection systems; and precision work in experimental development. Successfully handled these departments for large, nationally known organization producing electric refrigerators and radios. Box 442.



Learn at home new easy way. Oldest, largest home study electric refrigeration school offers thorough, practical training, endorsed by Servel, Kelvinator, Copeland, Zerosee, and other leading manufacturers. Wonderful pay-raising opportunity for service men; practical help to dealers, salesmen, manufacturers. Special proposition to firms who wish to train staffs. FREE BOOK explains everything. No obligation. Utilities Engineering Institute, Dept. 942, 404 No. Wells St., Chicago, Ill.

ANNUAL GENERAL ELECTRIC MEETING APRIL 19

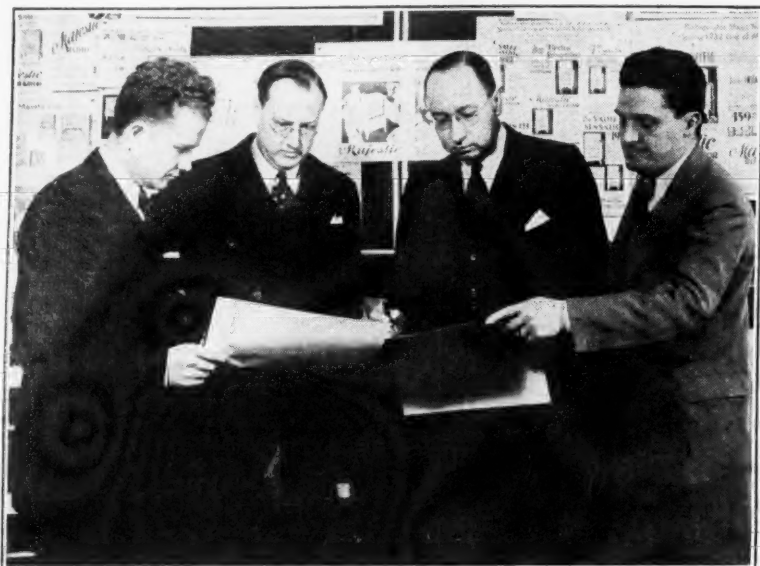
SCHENECTADY, N. Y.—The annual meeting of the stockholders of the General Electric Co., at which directors for the coming year will be elected, has been set for April 19 in the company's office here, according to announcement sent out by W. W. Trench, secretary of the Board of Directors.

Holder of common stock of the company of record at the close of business hours, March 18, are entitled to vote.

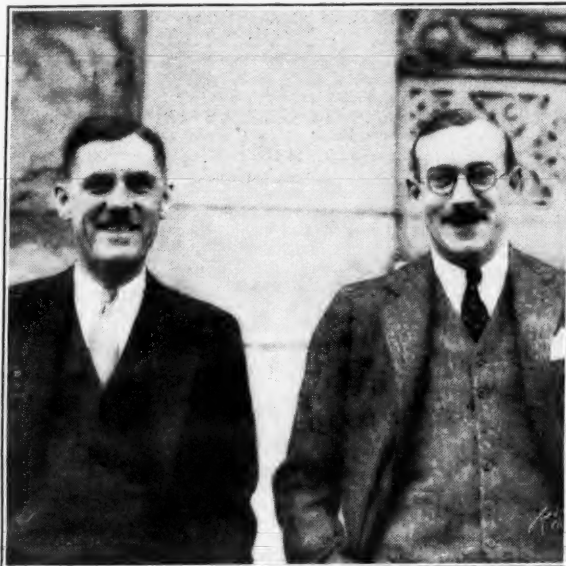
HARVESTER FIRM NAMED SERVEL DEALER

BANGOR, Me.—The Bangor Harvester Co. of this city has been appointed dealer for Servel commercial refrigeration by George B. Williams, Servel distributor, Portland, Me.

Majestic Distributors Survey New Standard Line



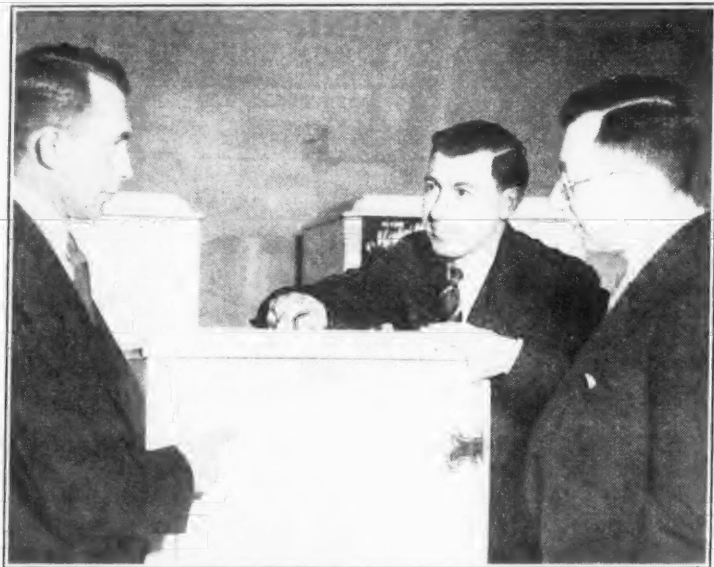
Final plans for the introduction of Majestic's new standard line with an advertising barrage are surveyed by Hubert Smith, sales promotion department; A. R. Johnson, refrigeration sales promotion manager; Earl Hadley, advertising manager, and M. W. Thompson, copy chief, space buyer, and publicity director.



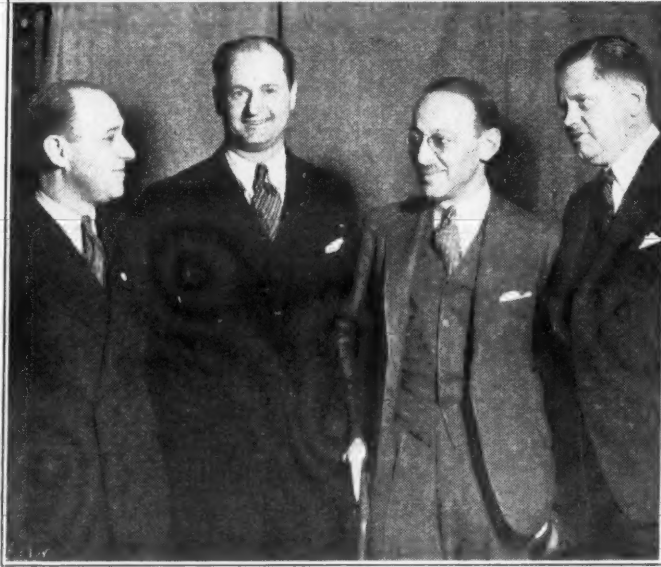
Out in the corn country, two Majestic distributors, George Proudfit, R. S. Proudfit Co., Omaha and Lincoln, Nebr., and H. C. Bonfig, Sterling Radio Co., Kansas City, Mo., meet to talk over plans for merchandising the new Majestic low-priced refrigerators.



Majestic's new model 345 undergoes a close inspection by four distributors at the recent Chicago meeting. Left to right: H. C. Bonfig, Kansas City, Mo.; Frank Steining, Pittsburgh; Arthur Alter, Chicago, and V. J. McGranahan, Toledo. This model retails for \$129.50 f.o.b. Chicago.



Ray Haimbaugh (left), Majestic's chief engineer, explains new features of the line to G. F. Weber and Lloyd Cohn, both of Radio Equipment Co., Texas distributor.



Harry Alter, Chicago; Fred Wilson, Newark; Francis Stern, Hartford, Conn., and C. R. Wagner, New York City, renew old friendships at gathering of Majestic distributors in Chicago.



The new office model is used as a conference table by C. C. Mathews, Indianapolis; Charles T. Naddy, Columbus, Ohio, and Ray H. Bechtol, Cleveland.

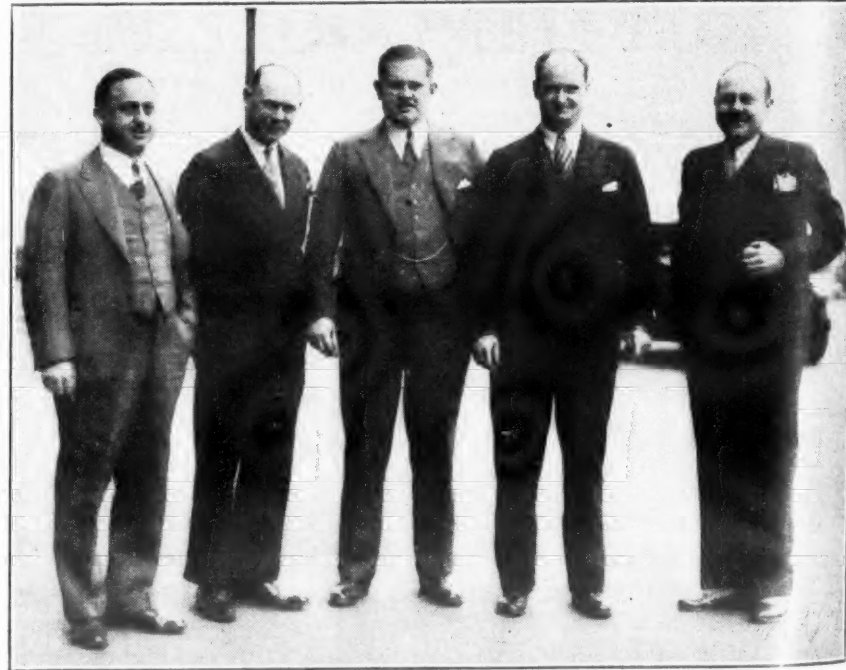


Mr. Meenan (extreme right), Majestic dealer in St. Louis, believes his salesmen should know something about Majestic construction, so he brought his sales force to Chicago for an inspection of the plant.

Surveys Credit



With questioning eyes, Ray Shadley, credit manager, surveys orders from the standpoint of ability of the customer to pay his bills.



John Ditzell (extreme right), refrigeration sales manager, talks with Julian Loeb, Brooklyn, N. Y.; Walter Kiehn, Toronto, Can.; C. R. Wagner, New York City; and Fred Wilson, Newark, at the Chicago meeting.



Herbert Hieb, C. W. Orin, and John Hieb, Majestic distributors in Iowa and South Dakota, study the new product.



Two old time distributors, Harry Shaw, Charleston, N. C., and Elmer Hamburg, Pittsburgh, swap yarns.



"Jim" Peirce, Mr. Grigsby's and Don Compton's right-hand man, explains the line to Harry Bibb, St. Louis, and Julian Loeb, Brooklyn.

ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office

The business newspaper of the refrigeration industry

ISSUED EVERY WEEK
VOL. 6, No. 31, SERIAL No. 159

Copyright, 1932, by
Business News Pub. Co.

DETROIT, MICHIGAN, APRIL 6, 1932

Entered as second-class matter
Aug. 1, 1927, at Detroit, Mich.

TEN CENTS PER COPY
THREE DOLLARS PER YEAR

NEW KELVINATOR WATER COOLERS ARE MODERNISTIC

Production To Start on
Eight New Models
Next Week

DETROIT—Kelvinator engineers have just finished the design of a new line of eight water coolers which will go into regular production some time next week. A new condensing unit and new low sides have been incorporated into the modernistic style of cabinets in the new water coolers.

The cabinets are of one-piece steel with a lower front panel, all screws being concealed within the water cooler. Cabinets are spot welded and Bonderized, then painted inside and out, and finished outside with two coats of Flemish (golden) bronze lacquer.

One-piece Steel Tops

One-piece steel tops, in the same finish as the cabinets, are used with all models except the bubbler type pressure coolers which have tops of vitreous enamel.

The condensing units are of the high suction pressure type, and employ standard Kelvinator parts, with the exception of the receiver, so that they may be serviced from a regular Kelvinator stock. The refrigerant is controlled by a high side float located in the machine compartment, Kelvinator engineers announce.

New Evaporator Design

The cooling units are of entirely new design, in which the refrigerant completely surrounds the water to be cooled with a sleeve type evaporator. The water reservoirs are silver plated, offering a storage capacity of 3/4 gal.

All faucets are designed for one-hand operation, and are chromium plated, with the Kelvinator crest appearing immediately above.

Three inches of granulated cork insulation, Hydrolined and sealed, are used throughout the new line of water coolers, while a sound deadening material lines the entire cabinet. Service adjustments are readily made, Kelvinator engineers claim, through the removable front panel.

Model BW-15, a bottle type water cooler, has a capacity for cooling three gallons of water per hour from 80 to 50° F.—the temperature range which applies to the following models.

Type CW-35 is a pressure type cooler

(Concluded on Page 2, Column 5)

IMPERIAL BRASS BUYS OUT C. M. SMILLIE OF DETROIT

CHICAGO—Purchase of the patent rights and entire line formerly manufactured by C. M. Smillie & Co., Detroit, is announced by the Imperial Brass Mfg. Co., here.

C. M. Smillie & Co. manufactured precision tubing cutters, flaring and reaming tools, and tube benders, as well as other equipment used in the manufacture of machines for sulphur dioxide and methyl chloride refrigerants.

Imperial Brass Mfg. Co. will continue to manufacture the Smillie line in addition to its own valves and tools.

SEIBEL ESTABLISHES BRANCH IN NEW YORK CITY

NEW YORK CITY—Extension of operations east of the Mississippi by Seibel Refrigeration, Ltd., air conditioning engineers, through the leasing of space for a New York City branch office at 90 West St. was revealed last week by Charles F. Noyes Co., Inc., real estate brokers of this city, through whose agency the transaction was effected.

BAKER ICE MACHINE OPENS BRANCH IN DALLAS

OMAHA—The Baker Ice Machine Co. of Texas, subsidiary of the Baker Ice Machine Co., Inc., located in this city, has opened a small branch office in Dallas.

The subsidiary company has its main offices and shops at Fort Worth.

Spring ASRE Meeting Set for June 9-12 on M. I. T. Campus

NEW YORK CITY—June 9, 10, and 11 have been set as dates for the 19th spring meeting of the American Society of Refrigerating Engineers. Sessions will be held on the campus of the Massachusetts Institute of Technology, according to A. R. Stevenson, chairman of the program committee.

Society members will be guests at the M. I. T. dormitories at a cost of one dollar per day, Everett L. Ryan of the Boston A.S.R.E. section, announces. M. I. T. graduations will be finished.

Among the paper already scheduled are those on the elements of air conditioning, moisture absorption in cold storage, the steam ejector system of air conditioning passenger cars, and marine and truck refrigeration.

WESTINGHOUSE ADDS 7 DOMESTIC MODELS

MANSFIELD, Ohio—Four additions to the Westinghouse DeLuxe line and three new standard models are being introduced to distributors of the Westinghouse Electric & Mfg. Co. in sales meetings this month.

Featured by both lines are the all-steel cabinets and all-steel frames, Westinghouse engineers point out. Built-in porcelain crisper trays and new rolling shelves have been introduced in the DeLuxe models, as has the interior electric light controlled by opening of the door. All DeLuxe models have porcelain interior and exterior finishes.

Model AP-73, the smallest refrigerator in the DeLuxe line has a capacity of 7.2 cu. ft. measured by N.E.M.A. standards, and 12.8 sq. ft. of shelf area. It produces 96 ice cubes, or 11 lbs. of ice in three trays, one of which is rubber and another a deep dessert tray. This model is 60 in. high, 32 in. wide, and 24 1/2 in. deep.

Model AP-90 in the DeLuxe line is a double-door refrigerator with 9.0 cu. ft. of storage capacity, and 15.7 sq. ft. of shelf area. It makes 96 ice cubes in three trays, or 11 lbs. of ice. Its dimensions are 60 in. high, 39 in. wide, and 24 1/2 in. deep.

A wider double-door model is the DeLuxe AP-130 which offers 13.0 cu. ft. of food storage capacity, and 24.8 sq. ft. of shelf area. This model produces 192 ice cubes or 21 lbs. of ice in seven trays, including one deep dessert tray and one rubber tray. In size it is 60 in. high, 51 in. wide, and 28 in. deep.

Model AP-200 is the largest size in the line, providing 20.1 cu. ft. of food stor-

(Concluded on Page 2, Column 1)

4 COFFIN AWARDS MADE TO G. E. MEN IN REFRIGERATION

Ideas of Refrigeration
Workers Win
Recognition

SCHENECTADY, N. Y.—Four of the 22 awards for constructive ideas, just presented to employees of the General Electric Co. by the Charles A. Coffin Foundation, dealt with the manufacture of electric refrigerators, according to an announcement of last week.

Coffin awards, established in 1922 as a tribute to the first General Electric president, were made to 12 factory employees, eight engineers, and two salesmen.

In addition to the four refrigeration suggestions were four concerned with electric welding, and three awards for development of Thyrite, a new substance which serves as a good electric insulator at low voltages and as a conductor at high voltages, it is claimed.

The awards are as follows: Factory employees—Earl J. Stewart, John Guare, Edward J. Burke, Henry J. May, and Albert Alexay, all of Schenectady, N. Y.; Erwin C. Schlupf and Emil J. Bartz of Erie, Pa.; Adolph J. Rose of Fort Wayne, Ind.; Edward Aurada of Cleveland; Oscar E. Frederick of Philadelphia; Gordon F. Kelley of Lynn, Mass.; and Jacob J. Vienneau of Pittsfield, Mass.

Engineers—Karl B. McEachron, L. H. Whitney, J. R. T. Craine, and Frank M. Clark of Pittsfield, Mass.; Marion A. Savage and C. A. Nickle of Schenectady, N. Y.; E. H. Horskot of Erie, Pa.; and William A. Lewin of Chicago.

Salesmen—David P. Burleigh of New York City; and Francis E. Fairman of Pittsburgh.

Awards were made to the following for suggestions on refrigeration:

1. Albert Alexay of the Schenectady works laboratory, who designed an automatic machine for exhausting and charging refrigerator units. The application of the machine resulted in a more uniform quality of product and consequently lowered manufacturing costs. The equipment eliminates the uncertainty of the human element in these processes, it is explained. Mr. Alexay is a mechanical designer.

2. Adolph J. Rose, fractional horsepower motor department, Fort Wayne, Ind., developed an iron-core choke coil for application in refrigerators sold for use on direct-current circuits. The coil is only one-half as heavy as the auxil-

(Concluded on Page 3, Column 4)

In This Section— Fundamentals of Refrigeration

THE elements and fundamentals of refrigerating machines, as clearly described in the testimony of H. R. Van Deventer before a Chicago court, will be found on pages 4, 6, 8 and 10 of this issue (Engineering Section).

Mr. Van Deventer, a New York patent attorney specializing in refrigeration, testified as an expert before Master Roswell B. Mason of the Circuit Court of Cook County as part of the defendant's evidence in the lawsuit brought by six Chicago ice companies against the city of Chicago to force a revision of the Chicago Refrigeration Code.

DETAILS OF TRICOLD MODELS ANNOUNCED

BUFFALO—Complete specifications have just been announced on the new Tricold refrigerator recently introduced by the Tricold Refrigerator Corp. of this city.

Each of the two Tricold models has two separate and insulated compartments for the preservation of food. In the large model, the "Imperial," 8 cu. ft. of capacity are provided in the top compartment which is maintained at 40° F., while in the same model, the lower compartment offers 2 cu. ft. of capacity at 10° F. for storing frozen desserts, ice cream, etc.

The smaller Tricold, the "Host," has 6 cu. ft. of storage capacity at normal temperatures, and one cu. ft. in the lower compartment at 10° F.

Cooling of the two compartments is accomplished by first passing the methyl chloride refrigerant through the American Radiator Castincoil evaporator (via an American Radiator expansion valve), and then routing the surplus refrigerant through the McCord finned cooling unit in the normal temperature compartment and back to the Universal Cooler condensing unit.

Utilization of considerable area provided by the McCord finned cooling units is claimed to keep the relative humidity in the 40° compartment high enough to prevent dehydration of food. The Imperial has a cooling unit 16 in. long with 8.55 sq. ft. of surface, while the Host evaporator is 12 in. long with 6.55 sq. ft. of surface.

The Penn Electric Switch control works from a thermostat in the normal temperature compartment to start the compressor whenever the temperature rises above 40° F., and to turn it off when 35° is produced.

Both models use Wagner motors, the Imperial having a 1/4-hp. size while the Host uses a 1-6 hp. motor. Measured according to A.S.R.E. methods, the large condensing unit has a capacity of 6.9 lbs. of ice melting capacity per hour, and by the same rating the smaller condensing unit will produce 5 lbs. of ice melting effect per hour.

Four inches of Balsam Wool insula-

(Concluded on Page 2, Column 2)

FERRO ENAMEL CO. PUBLISHES BOOK ON PORCELAIN

CLEVELAND—A new text-book, "The Advanced Technique of Porcelain Enameling," edited by J. E. Hansen, has been published by the Ferro Enamel Corp. Mr. Hansen is research engineer for the corporation.

Among the chapter headings of the 300-page volume are: "Selection and Fabrication of the Base Metal for Enameling"; "Enamel Mill Room Practice"; "Mill Additions—Color and Color Oxides," "Process Control Methods," and "Wage Incentives."

The book is sold through the Enamel-ist Publishing Co. of Cleveland, and is priced at \$3.50.

PORCELAIN ENAMEL INSTITUTE TO CONVENE MAY 26

CHICAGO—The second annual meeting of the Porcelain Enamel Institute has been set for Thursday, May 26, at the Hotel Cleveland, Cleveland, according to announcement by the institute last week.

"Possibilities of Porcelain Enamel in New and Old Markets" will be the general theme around which the program is being built.

CARRIER DESIGNS AIR CONDITIONER FOR RETAIL STORE

Stages Demonstration of
Steam Ejector
System

NEWARK—Engineers of the Carrier Engineering Corp. have adapted the steam ejector system of air conditioning, now being installed in a number of railroad car diners, to retail store installations, and on March 23 a public demonstration of the new Carrier comfort conditioning unit was staged on the grounds of the Carrier Research Corp.

The demonstration took place within a specially constructed model store which was totally enclosed in a shed to form an enclosed space around the store structure. The dimensions of the store proper were 20x55x13 ft. representing 14,300 cu. ft. of volume.

Reproduce Severe Summer Condition

The object of the demonstration was to cool and condition the store area in the face of severe "outside" temperature and humidity maintained in order to represent desirable shopping conditions.

While the test was in progress, the outside temperature in the shed surrounding the store was kept at approximately 97° F. with a relative humidity of 78 per cent. The relative humidity in the store was 50 per cent with a temperature between 78 and 85° F., Carrier engineers report.

The equipment used for cooling the store consisted of a Carrier comfort conditioning unit suspended in the unused space over the show windows or vestibule. This unit, which contained the cooling coils, fan and air filter, was connected by a duct to a specially designed diffuser outlet located above the entrance door.

Recirculates Some Air

The air to be conditioned was drawn into this unit from the store itself while at the same time another opening was provided through which outside air was taken for ventilation.

A Carrier steam ejector system of refrigeration supplied water at about 40° F. which was pumped through the cooling coils of the unit. Turning a steam valve started this system, while an electric switch started the fans drawing air across the coils.

The nature of the outlet through which the air was introduced was such that the quantity of air circulated with-

(Concluded on Page 3, Column 1)

INTERBORO HOIST DEVICES SOLID CO₂ SHIPPING BOX

LONG ISLAND CITY, N. Y.—A new shipping box for solid CO₂, with a capacity of 18 50-lb. cakes, and weighing 235 lbs. complete, has been developed by the Interboro Hoist & Body Co.

Inside dimensions of the box are 22x33x33 in. Insulation is 4 in. Lata Balsa throughout, covered inside and outside with a heavy waterproof fabric.

The design incorporates steel corner framing with a channel around the top, angles on vertical corners, and a band iron frame around the bottom. These parts are all electric arc welded into a solid mass, which carries the handles and lid fasteners. The outside surface is finished with Glidden's Metallite.

NEW YORK SCHOOL TEACHES REFRIGERATION SERVICE

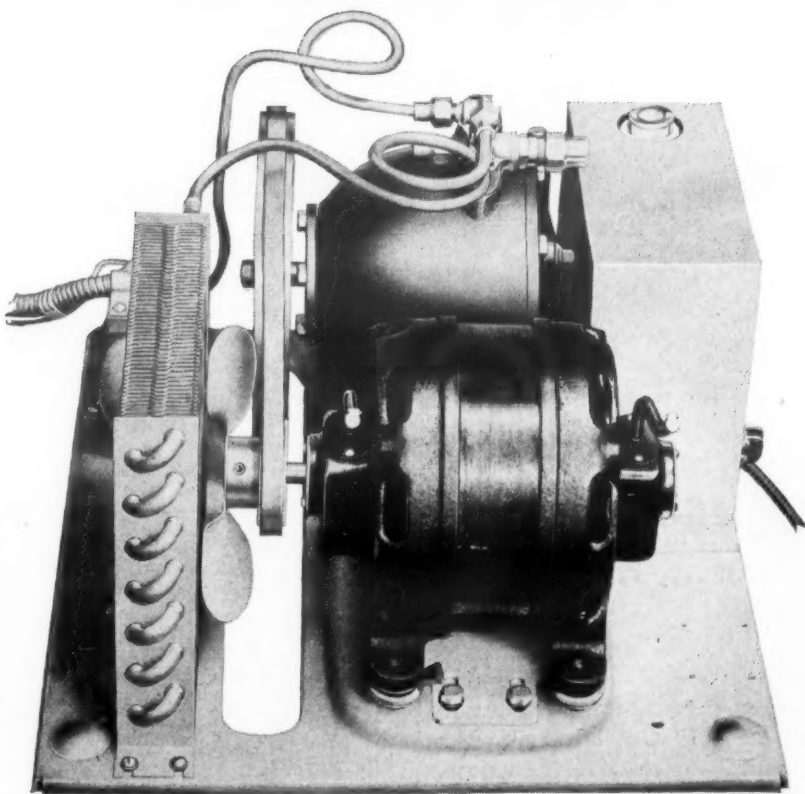
NEW YORK CITY—Practical shop instruction has been organized to train refrigeration service men in the Herkimer Institute of Refrigeration, 1819 Broadway, New York City, according to Herbert Herkimer, director.

Instruction is given individually, and the course is completed in 30 days.

When the course is completed, an examination is given before the student is awarded his certificate of graduation.

Mr. Herkimer, a graduate mechanical engineer, also offers a night course on Monday, Wednesday and Friday evenings for residents of New York and vicinity. This course takes 10 weeks to complete.

New Majestic Machine



Close-up of the new condensing unit which Grigsby-Grunow engineers have designed for their low-priced refrigerator. The machine is a rotary, and produces 70 lbs. of ice melting effect per 24 hours.

WESTINGHOUSE ADDS 7 DOMESTIC MODELS

(Concluded from Page 1, Column 2)
age capacity, and 37.7 sq. ft. of shelf area. It has four doors. This refrigerator manufactures 192 ice cubes, and like AP-130 has a twin evaporator. It is 76 in. high, 51 in. wide, and 28 in. deep.

Two single-door refrigerators and one double-door type have been added to the Westinghouse standard line. The standard line is characterized by porcelain interiors and lacquer exteriors. Model AL-45, a single-door refrigerator, has 4.2 cu. ft. of capacity, and 8.4 sq. ft. of shelf area. It produces 54 ice cubes, or 5½ lbs. in three trays, one of which has a rubber freezing grid. This model stands 55½ in. high, 24¼ in. wide, and 22½ in. deep.

Model AL-73 offers 7.2 cu. ft. of food storage capacity, 12.8 sq. ft. of shelf area, and makes 96 ice cubes or 11 lbs. of ice in three trays, one of which is a deep dessert tray. Its dimensions are 60 in. high, 32 in. wide, and 24¼ in. deep.

The double-door model in the standard line is AL-90 with 9.0 cu. ft. of food storage capacity, and 15.7 sq. ft. of shelf area. It has ice making capacity for 96 cubes or 11 lbs. Dimensions are 60 in. high, 39 in. wide, and 24¼ in. deep.

HENRY McCOMB WORKING ON NEW ICE TRAY

CHICAGO—Henry G. McComb, for two years an engineer with the refrigeration division, Grigsby-Grunow Co., and later sales promotion manager of the division, is now devoting his time to the development and promotion of a new non-sticking ice tray.

This tray he first offered to Majestic, but the company's large scale operations precluded its adoption.

Majestic Service—Radio and Refrigeration



The service organization of Grigsby-Grunow Co. gathers for a picture. Rear row, left to right: T. A. Lavorene, H. M. Threlkeld, E. S. Sauer, J. Benkowski, K. F. Schmidt, E. A. Hilton, Robert Olker. Center row: Paul Eckstein, F. Osborne, E. S. Maguire, F. J. Cornell, J. G. Dunville, C. Walker. Front row: C. A. Brinkert, A. DeB. Gaines (Refrigeration Service Manager), B. Goetchell, M. T. Nordengrin (Radio Service Manager).

Specifications Given For Tricold

(Concluded from Page 1, Column 4)

tion are used in the wall, door, and bottom of the low-temperature compartment, two inches of the same insulant separate the two compartments, and

three inches of Balsam Wool insulate the normal temperature compartment.

Rex cabinets are standard, with white porcelain interiors and exteriors. Door liners are of Panelyte, hardware is chromium. The normal temperature compartment is illuminated by a dome light when the door is opened.

The Chillard line of refrigerators offered by the Tricold Refrigerator Corp. is of conventional design.

SANITARY REFRIGERATOR INTRODUCES NEW MODELS

FOND DU LAC, Wis.—Two new models, a 4-cu. ft. and a 9-cu. ft. box, have been added to the line of the Sanitary Refrigerator Co. for 1932, according to H. B. Miller of the company.

The line now consists of five models: the 4-cu. ft., two 5-cu. ft. models, a 7-cu. ft., and a 9-cu. ft.

The refrigerators are available in white or a combination of green and ivory; on special order they are made up in any color specified.

The 5-cu. ft. models differ in that one has white enamel interior and the other seamless porcelain interior. The larger models come only with porcelain interiors.

Two aluminum freezing trays are standard equipment in all models, with a total ice cube capacity of 56 cubes. A reciprocating compressor and 1-6 hp. motor are used in the condensing unit, which is in the base of the box.

GENERAL ELECTRIC CASE TESTS CONCRETE AT 4° F.

DETROIT—The use of electric refrigeration for testing concrete highway materials attracted the interest of many visitors to the recent annual convention of the American Road Builders' Association, here. With the aid of a large General Electric refrigerator display case, the Michigan State Highway Commission prepared exhibits to illustrate clearly to the layman as well as the highway engineer the underlying causes of "frost heaving"—the buckling and breaking of concrete pavement under the action of frost.

The engineers demonstrated actual results of frost action on a frozen section of pavement which they were able to maintain at temperatures as low as 4° F.

In explaining the causes of highway failures the engineers state that research has established definitely that excessive heaving of road surfaces is not due entirely to the expansion which takes place when water normally contained in the sub grade soil freezes. In many cases the addition of water results in direct formation of ice plates that push the soil particles apart in the direction of freezing, they report.

KELVINATOR DESIGNS NEW WATER COOLERS

(Concluded from Page 1, Column 1)
of the same capacity with the faucet in front.

Similar in capacity to CW-35 is model BWC-25 which has also a refrigerated compartment which will cool beverages, cigars, lunches, etc., to a temperature of 50° F. by a separate cooling coil. It is provided with a lock and key, and is porcelain lined with a drain in the center.

Model CWC-55 is a pressure type water cooler, with a refrigerated compartment, and doubled capacity, being built to cool six gallons of water per hour. CW-45 is a six-gallon pressure type cooler with no refrigerated compartment.

Type CWC-65 is a pressure cooler with six gallons of capacity per hour, and the refrigerated compartment.

A bubbler top and a place for a glass filler feature model CW-85, a pressure type with a six-gallon capacity, and is equipped with a pre-cooler.

Model CW-95 is a pressure cooler with a top bubbler, provision for a glass filler, a pre-cooler, and a capacity of 12 gallons of water per hour.

ALLTMONT ASSISTS IN DEVELOPING COOLERS

DETROIT—S. V. Alltmont, who was named manager of the water cooler division of Kelvinator Corp. on Jan. 1, is credited with having been very active in assisting the Kelvinator engineering and production departments to design the new Kelvinator water coolers announced in this issue of the News.

Mr. Alltmont is a native of Houston, Tex., and has spent many years in the electrical jobbing and utilities field. He

Heads Water Cooling



S. V. ALLTMONT
Manager of the water cooler division at Kelvinator Corp.

came to Kelvinator from the Empire Public Service Corp. of Philadelphia, where he was manager of the merchandising department.

ST. LOUIS HIGH SCHOOLS INSTALL SERVEL

ST. LOUIS—The Mack Electric Co., Servel commercial distributor in this territory, has made seven sales to the St. Louis Board of Education recently for installations in city school cafeterias.

Making Winter for Road Materials



Road Builders tested concrete with winter conditions in this G. E. case.

COPPER

HYDROGEN...

ELECTRICALLY

WELDED

COPPER Hydrogen Electric Welding is a process by which steel parts are welded by pure copper at all points of contact.

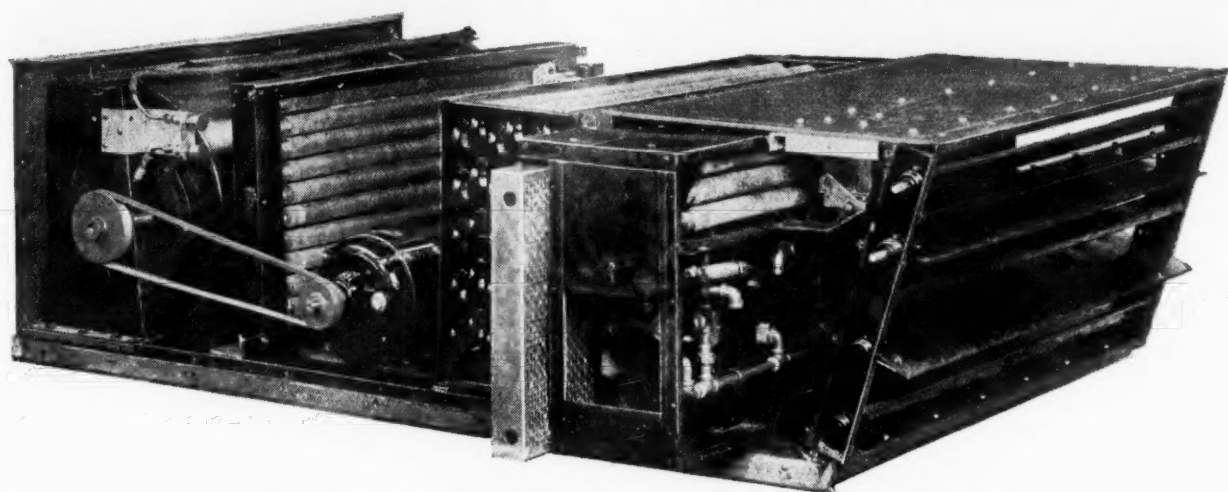
Several welds are possible in the one operation. Thus an entire assembly made up of several steel parts can be completed in a single passage through the hydrogen-charged electric furnace.

Long life, gas tightness, strength at the joints and a clean, neat welded surface are assured by this method of welding. Write for information on general commercial welding of any type.

BUNDY TUBING COMPANY
4815 BELLEVUE AVE., DETROIT, MICH., U. S. A.

BUNDYWELD TUBING

To Cool Air for Retail Stores

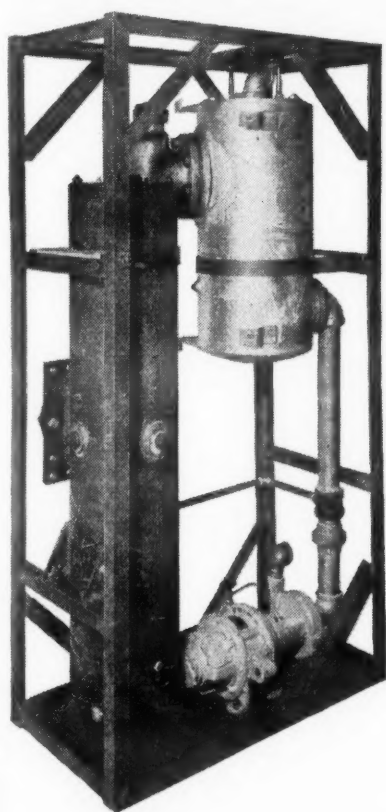


Carrier's new air conditioning unit for retail stores uses water as the refrigerating medium. Air enters this unit from the left, passing through cooling coils (at right of electric motor), then through heating coils (at left of motor, and out through the blower.

CARRIER USING STEAM IN NEW CONDITIONER

(Concluded from Page 1, Column 5)
in the store was 2½ times the quantity supplied by the unit. This was done to insure a uniform distribution of draft.

Steam Ejector Unit



The water cooling unit is remotely installed, and uses a steam ejector to vaporize and cool the water.

less air with even temperature and without an elaborate system of ducts, engineers explain.

For summer cooling, a refrigerant, generated in a separate apparatus, is

circulated through the cooling coils. The blowers draw air across these cold coils and distribute it through the outlet into the store. Contact of the air with the cold surface of the coil cools and at the same time dehumidifies the air, so that cool dry air flows from the outlet. A system of dampers regulates the volume of air handled and also admits outside air for ventilation purposes. This regulation controls the amount of cooling to be done in accordance with requirements.

Located above the entrance door was a specially designed extra outlet ejecting a curtain of cool air downward across the door opening. This curtain of air makes it possible under certain conditions to leave the door open, Carrier engineers claim.

The comfort conditioning unit used in this demonstration was rated at 6 tons of refrigeration capacity, and handles 1,600 cu. ft. of air per minute.

One end of the conditioning unit was connected to a diffuser outlet, through which the air conditioned in the unit was distributed into the store space. Cold water generated by a vacuum process in the steam ejector machine was pumped through the cooling coil and the air drawn over it by the fan. Contact with this cold surface automatically cooled and dehumidified the air which then was ejected through the outlets into the store. For winter operation, it was pointed out, the air conditioning unit is equipped to warm and humidify the air.

The method of refrigeration by steam makes use of the principle that water under a vacuum will evaporate, or boil at much lower temperatures than under ordinary conditions.

A jet of high velocity steam passed over an opening into a tank in which ordinary tap water is sprayed, quickly draws a vacuum on this tank by sucking out the air and the water vapor given off by the water. The result is that the water then begins to boil at a temperature approximating 40 to 45° F. The water vapor given off in this process is entrained by the steam and the resultant temperature of the water remaining is sufficiently low (about 40° F.) to become medium for the cooling coil, Carrier engineers explain.

The cold water is now pumped out of the tank and through the cooling coil where it cools the air and is then returned to the tank for recooling by the steam ejector method. A constantly circulated supply of refrigerated water

generated in the tank by the vacuum action of the steam ejector, flows through the cooling coil.

D. E. French, executive vice president of the Carrier Research Corp., in charge of the tests, claims that the steam method of refrigeration offers wide possibilities to stores where a steam supply from a boiler is available, or can be installed, or in cases where steam may be purchased from a central plant.

PANGBORN CORP. NAMES NEW CHIEF ENGINEER

HAGERSTOWN, Md.—W. A. Rosenberger has been appointed chief engineer of the Pangborn Corp., local builders of sand-blasting booths for use in the manufacture of electric refrigerator parts.

Summerheat Corp. Has New Unit

DOWAGIAC, Mich.—The Summerheat Corp. of America has announced the completion of production plans for the American Ace commercial refrigerating unit.

The American Ace was formerly produced by The American Foundry Equipment Co. of Mishawaka, Ind.

The Summerheat Corp. purchased the rights and property of the refrigeration division of the American Foundry Equipment Co.

The American Ace is a methyl chloride unit manufactured in one size only, but with a range of capacity to take care of average commercial requirements. It is adaptable to small walk-in coolers and various models of display cases.

Because of the nature of its design the use of stuffing box, flywheel, and exposed moving parts are avoided. The pistons move at motor speed, being directly connected.

The entire compressor mechanism, with its permanent lubrication, is sealed and spring-floated.

4 G. E. COFFIN AWARDS GIVEN IN REFRIGERATION

(Concluded from Page 1, Column 3)
aries previously used, and is less expensive, according to the announcement. The new coil also improves the conditions of supply for this part, as General Electric can make the coil in its own shops whereas formerly it was obliged to buy coils from outside concerns. Mr. Rose is a supervisor.

3. Earl J. Stewart of the Schenectady works improved methods of testing, and contributed developmental work on certain types of electric refrigerators. He offered suggestions continually as to the details of construction of certain parts

MINNEAPOLIS - HONEYWELL HAS NEW BURNER CONTROL

MINNEAPOLIS—Engineers of the Minneapolis-Honeywell Regulator Co. have just announced their new Protectoglow, a device which provides protection against the escape of unburned gas or oil in the event of flame or pilot failure. Although it may be used in place of the customary combustion or pilot safety device, its outstanding characteristic is its ability to handle installations where conventional controls are inadequate.

Entirely electric and without moving parts, it is not dependent upon temperature. The heart of the device is the Protectoglow tube, which acts as an electrical relay and is capable of operating at the command of minute electric current passed through the flame itself.

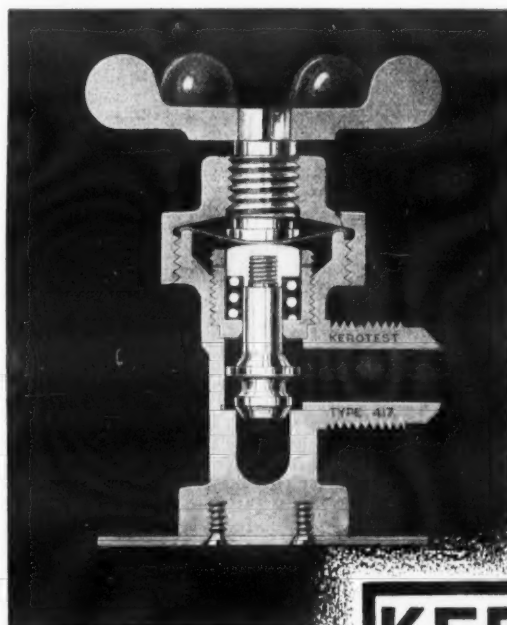
Should the flame fail, the circuit through the flame is broken, instantly shutting off the gas or oil flow. In the absence of pilot flame, the Protectoglow will not allow the burner to start.

The Glo-Relay is used in conjunction with the Protectoglow and serves to operate the valves or motor of the burner at the command of the thermostat, control switch, or Protectoglow. It is self-contained and is available for either constant or intermittent ignition burners.

and also as to methods of manufacture so that substantial savings in labor, material and spoilage are expected to result.

4. Edward J. Burke of the Schenectady works has done special work in the elimination of spoilage and waste in the refrigeration department, and suggested the use of "varsol" in place of the mixture of naphtha and carbo-tetrachloride which was previously used. This is a more economical practice and also reduces both the fire and the toxic hazards, according to General Electric engineers.

*Good valves and fittings
reduce the upkeep
of those 3 year
guarantees*

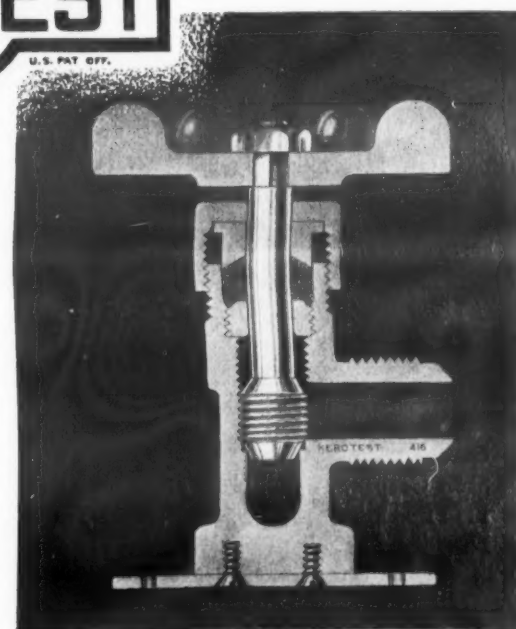


KEROTEST
REGISTERED U.S. PAT. OFF.

Every single part of a modern refrigerator must be 100 per cent to merit a three year guarantee. That is why you can rely implicitly on all Kerotest Refrigerator Valves to do their full share in maintaining the highest standard of refrigerator service.

Every Kerotest Valve is made to sell on a performance basis, not price,—every valve is individually tested and inspected,—the two styles of valves illustrated herewith meet the full approval of the Underwriters Laboratories.

Whatever may be your requirements in refrigerator valves you can always rely on KEROTEST—a pioneer manufacturer of quality valves exclusively.



KEROTEST MANUFACTURING COMPANY, PITTSBURGH, PA.

Distributors

Dayton, Ohio.....517 Grafton Avenue
E. J. Kimm
Los Angeles, California.....224 East 11th Street
Van D. Clothier
Chicago, Illinois.....2317 West Marquette Road
G. C. Taylor
Detroit, Michigan.....6-247 General Motors Bldg.
W. H. Mark Hanna
Cincinnati, Ohio.....Burbank Street
The Merkel Bros. Co.
Wilmington.....North Carolina
N. Jacobi Hardware Co.

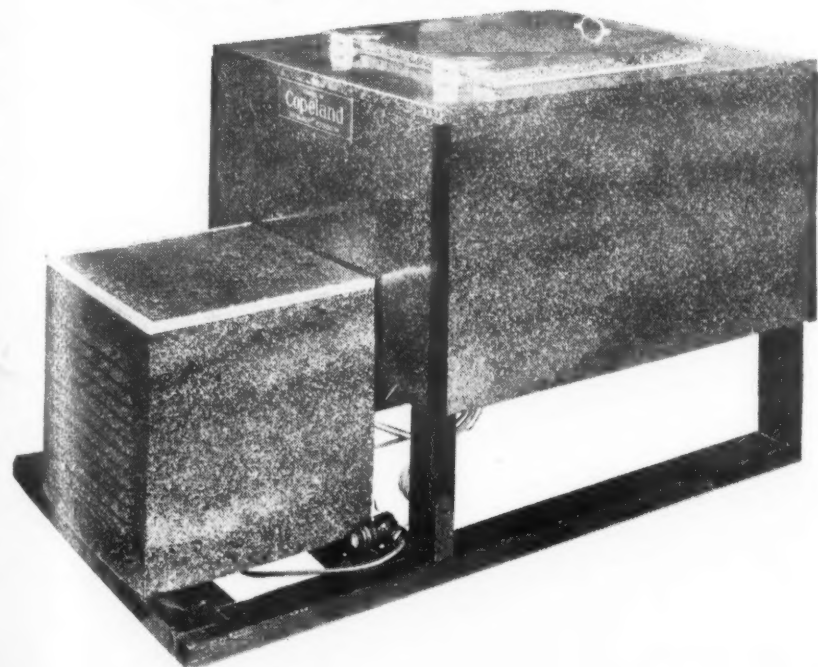
Boston, Massachusetts.....110 High Street
A. E. Borden Co.
Newark, N. J.....Jefferson and Chestnut Streets
McIntire Connector Co.
New York City.....58 Warren Street
Paramount Electrical Supply Co., Inc.
New York City.....246 Fifth Avenue
W. H. Schrank Company
Philadelphia, Pennsylvania.....523 Arch Street
Fretz Brass & Copper Co.
Baltimore, Md.....108 South St.
Clendenin Bros., Inc.

Greensboro.....North Carolina
Home Appliance Service Co.
St. Louis, Missouri.....2817 Laclede Avenue
Brass & Copper Sales Co.
San Francisco, Calif.....Merchants Exchange Bldg.
A. W. V. Johnson
Washington, D. C.....1333 Wisconsin Ave.
Refrigeration Equipment & Supply Co., Inc.

EXPORT DISTRIBUTORS

New York City, New York.....116 Broad Street
Melchior Armstrong, Dessau Co., Inc.

Testing Storage Batteries



To test storage batteries at 10° below zero, the Copeland Refrigeration Co. of Chicago has installed testing equipment shown above in the Universal Battery Co. and the Vesta Battery Co., in Chicago. Six batteries can be tested at once. The installation uses an American Radiator expansion valve, an ice cream cabinet control, and has 3½ in. of cork insulation. The low side consists of copper tubing around the four walls, and is protected by a metal rack.

Describes Elements of Refrigeration Systems

CONSULTING ENGINEER EXPLAINS PRINCIPLES

Editor's Note: Complete testimony is published herewith of H. R. Van Deventer, New York consulting engineer, given on March 25 before Master Mason as defendant's evidence in the suit brought by six Chicago ice companies (headed by the Consumers Co.) to force a revision of the Chicago Refrigeration Code. Of special interest are Mr. Van Deventer's informative explanations of refrigeration systems and their component parts.

CONSUMERS CO.
vs.
CITY OF CHICAGO
BEFORE MASTER MASON
Friday, March 25, 1932,
2 o'clock, p. m.

Parties met pursuant to adjournment.
Present: Mr. Bourland,
Mr. David,
Mr. Wernuth and
Mr. Foss.
Harry R. Van Deventer, called as a witness on behalf of the defendants herein, having been duly sworn, was examined in chief by Mr. Wernuth and testified as follows:

Q. You may state your name?
A. Harry R. Van Deventer.
Q. And your address?
A. 342 Madison Ave., New York City.
Q. How old are you?
A. Fifty-four years old.
Q. Now, will you state your business and experience and education without my asking you a lot of specific questions?

Van Deventer's Experience

A. I am a consulting engineer. After graduating from college with the degree of Bachelor of Science and Engineering about 1907, I started the design and construction of refrigeration apparatus. Since that time, with the exception of a short period during the World's War, I have been engaged in the design and construction of refrigeration apparatus particularly of the household type. I have investigated a large number of refrigerants and designed apparatus for use therefor.

I have applied for a number of patents, secured a number of patents on refrigeration apparatus and have prosecuted a large number of patents relating to refrigeration for various clients, as I have been for 23

years a member of the patent bar practicing before the United States Patent Office, and the Canadian Patent Office.

I have continued through this period to generally inform myself in respect to the state of the art by reading the literature relative thereto, including the current publications and the standard text-books on the subject.

I am a member of various engineering societies, including the American Institute of Electrical Engineers and the American Society of Refrigeration Engineers.

I am a licensed professional engineer registered to practice in the State of New York and have appeared as an expert witness in connection with a number of suits relating to refrigeration.

Q. Now, Mr. Van Deventer, will you describe briefly, as briefly as you can, the various refrigeration systems that are in use?

A. I direct your attention to a drawing—

Differ Only in Arrangement

Q. Just a moment, we will mark this for identification Defendant's Exhibit No. 1 of this date, 3-25-32.

9.—which has been marked Defendant's

Diagram of an Industrial System

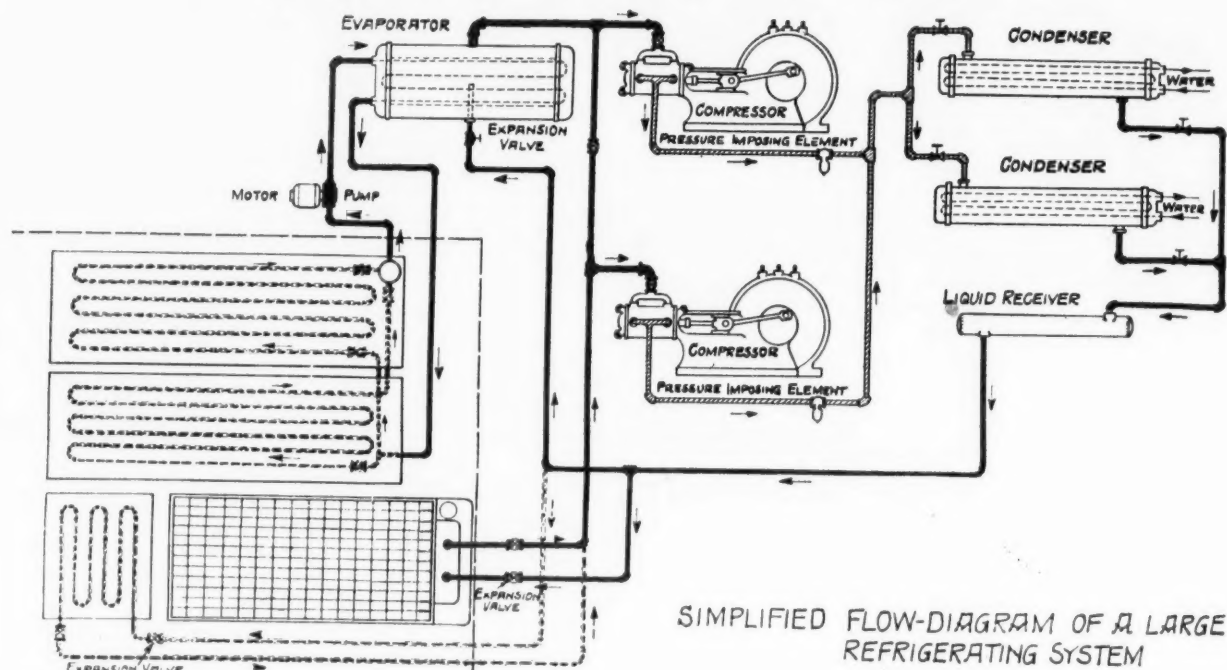


Exhibit 1—All the principal elements of a refrigeration system appear in this drawing of an ice-making plant.

years a member of the patent bar practicing before the United States Patent Office, and the Canadian Patent Office.

I have continued through this period to generally inform myself in respect to the state of the art by reading the literature relative thereto, including the current publications and the standard text-books on the subject.

I am a member of various engineering societies, including the American Institute of Electrical Engineers and the American Society of Refrigeration Engineers.

I am a licensed professional engineer registered to practice in the State of New York and have appeared as an expert witness in connection with a number of suits relating to refrigeration.

Q. Now, Mr. Van Deventer, will you describe briefly, as briefly as you can, the various refrigeration systems that are in use?

A. I direct your attention to a drawing—

Differ Only in Arrangement

Q. Just a moment, we will mark this for identification Defendant's Exhibit No. 1 of this date, 3-25-32.

9.—which has been marked Defendant's

Exhibit 1 of this date and referring to this drawing will describe the various elements shown therein for the purpose of showing that practically all refrigeration systems have a number of elements in common, and that the only difference between various plants for ice making and cold storage and other purposes is a question of arrangement of these fundamental units and involves mainly a change in the location and quantity of piping.

On this drawing I have shown two compressors, or pressure imposing elements as referred to in the Chicago code. Whether there are one or a number of compressors makes no difference in the operation of the system insofar as the theory of refrigeration is concerned.

Starting with an ice plant, that is to say, a plant for the manufacture of artificial ice, you will observe in the lower left hand corner of the drawing a portion colored blue, which consists of a floor over a tank and through this floor or in this floor there are openings through which cans of water are lowered into a tank and are there frozen into ice.

The tank is filled with a liquid solution of brine.

Q. What is brine?

Definition of Brine

A. Brine may be any suitable solution that will absorb heat and usually calcium chloride is used for that purpose, and the density of the solution is arrived at by putting in from one to three lbs. of calcium chloride per gal. of water.

In this brine is immersed a cooling coil which is shown at the right of the ice tank and to this coil is connected pipes conveying the refrigerant.

Q. How are those pipes marked?

A. Those pipes are marked in red and in yellow on this diagram, exhibit 1.

Between the pipe conveying the incoming liquid and the brine cooler is inserted what is commonly termed an "expansion valve." The expansion valve is to regulate the amount of refrigerant passing from the liquid supply line into the cooler.

Q. How is the expansion valve indicated on the drawing?

A. It is marked "expansion valve."

Q. All right.

A. After the liquid refrigerant enters this coil for the purpose of cooling the brine, it absorbs the heat and it turns from liquid to vapor. This vapor is then carried back to the suction side of the compressor and it is there compressed.

Q. Is that compressor marked on the drawing?

A. The compressor is marked "compressor" on the drawing.

Q. All right.

Then to Condenser

A. Leaving the compressor in a compressed state this vapor is conducted to a condenser which may be a coil or pipe or shell type condenser, and the liquid refrigerant is there subjected to the action of the cooling water. Here the heat which has been absorbed by the refrigerant in making the ice and in being compressed is removed from the refrigerant which liquefies. The liquid refrigerant is then stored in what is marked on the drawing a liquid receiver.

Q. Let me interrupt you right there. The condenser is marked as such on the drawing, isn't it?

A. Yes, sir.

Q. And you said shell type apparatus. Just what is that?

A. Shell type condenser is a condenser which may be described as a boiler having tubes therein.

Q. The function, its function, is the same as that of the condenser shown on the drawing, is that correct?

A. Exactly the same.

Q. All right.

A. There are a number of different types of condensers, but the function of them all is that of cooling the gas.

Next to Expansion Valve

The liquid is then taken from the liquid receiver and then conveyed to the expansion valve. There are many auxiliary devices used in a system of this kind that are not shown in the sketch, such as safety valves on various parts of the apparatus, by-pass and other valves and valves whereby if the pressure becomes excessive the refrigerant

may be discharged into the atmosphere or some other safe place.

But, the cycle of operations that I have just described is that common to practically all refrigerating plants of the compression type.

In the extreme lower left hand corner of the drawing—

Q. You are still referring to this exhibit 1 of this date?

A. Drawing, exhibit 1, there is shown a square denoting a room or anything such as an ice cream cabinet or the like which it is desired to cool and into which the refrigerant is directly discharged into a coil of pipe in this room.

Direct Expansion

This illustrates such systems as use the so-called direct expansion. And this method of using the expanded refrigerant differs from ice making, as I have just described in that the refrigerant, if it should escape from the pipe, would find egress to the room instead of to the brine as would be the case with the ice making system.

Directly to the left and in the center of the drawing I have shown two squares that represent two cold storage rooms. The amount of pipe incident to these rooms—

Q. Before you go to that, those are marked by a green color?

A. I will get to that in a minute. The amount of piping in these rooms—

Q. No, I mean on the cold storage part?

A. Yes, I am going to get to that in connection with the circulating system.

The amount of piping in these rooms depends upon the use to which they are to be put, that is to say, the temperature it is desired to maintain in these rooms, the amount of heat leakage present and the substance to be placed in the rooms from which the heat is to be extracted.

Q. You mean by that the difference between meat cold storage, for example, and fur storage, is that the point you are making?

A. That is it exactly. This piping in these rooms is commonly filled with brine which is circulated by means of a pump marked "pump" on the drawing. This brine is cooled in an evaporator marked "evaporator," through which the brine is circulated by means of the pump. The evaporator is also connected to the refrigeration system as shown by the red and yellow pipes in the drawing.

Functions in All Systems

A study of the drawing, exhibit No. 1, will now reveal that the compressor, condenser, expansion valve and evaporator are all common to a refrigeration system regardless of whether it is used for ice making, for cold storage or for practically any other purpose, the function performed by these elements being the necessary functions in any refrigerating system.

I have said nothing about the control of a system of this character. Control in practically all commercial plants is manual, that is to say, the control of the operation of the system as a whole is accomplished by an attendant.

Q. By "control," you mean shutting off and turning on and regulating, is that it?

A. I do.

The Master: Cut off, turn on and regulate what?

A. The refrigeration system as a whole and the degrees of temperature within certain limits are manually regulated by the turning of certain valves.

Operating Force

The Master: Q. What is the operating force back of it all, electricity?

A. It may be any suitable prime mover, electricity, steam engine, oil engine, gas.

I now call attention to sketch, Defendant's Exhibit 2 of this date, which shows the elements of a so-called household refrigeration unit, and here we have substantially the same elements as shown in exhibit No. 1.

Mr. Wernuth: Q. You are now talking about the basic elements of a household unit, is that right?

A. I am. We have a compressor, the condenser—which, by the way, in the large majority of household units is air-cooled, no water being used—a small liquid receiver, an evaporator and the equivalent of the expansion valve which is usually located upon or within the evaporator, and in addition a motor control which is a device so connected

to the system that it is influenced either by temperature or pressure, said control adapted to stop and start the operation of the compressor and thereby making the system automatic.

Q. As distinguished from what you previously termed "manual control" is that the point?

Air-cooled Condensers

A. Yes, sir. The elements shown in this sketch, figure 2, are identical in all respects, so far as function is concerned, with the elements shown in exhibit 1, except as I have before stated, the condenser is cooled, air-cooled, instead of water-cooled.

Q. How are those household units operated, I mean, the source of power, ordinarily?

A. Almost universally with an electric motor. I have not attempted in this brief description of the function of refrigeration systems to make any reference to the so-called absorption system, as there are but few absorption plants now in use, and none in use by the plaintiffs in this case.

Q. What system is used by the complainant?

A. The so-called compression system utilizing a power driven compressor.

Q. Referring to the first exhibit, you mentioned the adaptation of that system to ice cream. Will you carry that just a bit further as to other uses, if any, besides ice cream, if such a system is prevalent—I don't know whether I make my question clear or not.

Similar Cycle for All Uses

A. The possible uses which the system shown in exhibit 1 could be put to are so numerous that they embrace practically the entire range of refrigeration.

Q. I wanted you to mention some of the others, that is what I mean?

A. Well, the cooling of milk, the cooling of oil, beef, eggs, all kinds of foodstuffs, the preserving over long periods of time of any perishable article; the storage of furs.

Q. How about the butcher shop and delicatessen and things of that type?

A. The cooling of store counters, show cases, all kinds of industrial applications, such as cooling stock in candy factories, and in other technical and industrial establishments.

The ordinary butcher shop where a butcher keeps his meats for retail sales, the same thing applies, to all kinds of ice cream counters, soda fountains, the cooling of syrup cans, and to some extent now the cooling of trucks and other motor vehicles for the transportation of perishable commodities of all sorts.

Q. Now, then, you have covered a large commercial system and its other uses, also the household system; will you describe the multiple system, so-called?

A. The multiple system—

To describe a Multiple System

Mr. Wernuth: Just a moment, please. We offer in evidence Defendant's Exhibits Nos. 1 and 2 at this time. Any objection?

Mr. Bourland: I would like to see them.

The Master: Any objection?

Mr. Bourland: No objection.

The Master: They may be received and so marked. (Which said documents last above referred to were thereupon received in evidence as Defendant's Exhibits 1 and 2, of 3-25-32, respectively, are attached hereto and made a part of the record in this case.)

Mr. Wernuth: Q. All right, you may proceed now.

A. I direct your attention to the print, Defendant's Exhibit 3 of this date, which is typical of a so-called multiple system, this particular system being that of—

Q. Just a minute, we will mark that Defendant's Exhibit 3 of this date. All right, proceed.

For Three-story Apartment

A. —offered for sale by the Frigidaire Corp. The print shows three domestic refrigerator boxes located on three different floors of a building, with the compressor unit located in the basement. The pipe lines from the compressor pass through the riser control valves located in the basement and then extend upwardly to the different service boxes located on each floor.

Here pipes are tapped off and extend into the refrigerator cabinets. (Indicating.) There is no difference in the principle of operation of this system and that shown in Defendant's Exhibit No. 2 except that instead of one evaporator a number of evaporators are used, each evaporator having its own expansion valve.

I will discuss the apparatus used in connection with these multiple systems later on in my testimony.

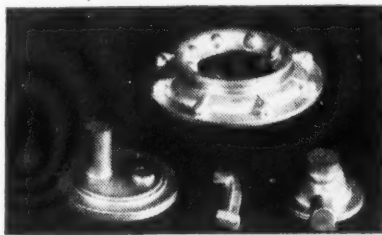
Q. The system shown by exhibit No. 1, namely, the commercial ice plant and other commercial uses, where is that assembled and how is it installed? Just state briefly.

A. The various component parts are made by different manufacturers. These parts are made in accordance with the various

(Continued on Page 6, Column 1)

Revere Brass Forgings

for
Gas-tight
Refrigerator parts



One of the oldest and most prominent manufacturers of refrigerators has consistently used Revere Brass Forgings for fittings in refrigerant lines.

Three important advantages appealed particularly to this manufacturer, whose letter to us says (in part):

"We are handling a gas which is extremely thin, and the close texture and grain construction of Revere Brass Forgings is a decided necessity. Another factor: with Revere Forgings we are able to maintain a definite inventory figure, not possible with castings because of high scrap. If it were necessary to revert to castings, we would be seriously handicapped in our manufacturing program."

Other Revere Products for the refrigerator industry:

Sheet Copper . . . available in every commercial variety.

Brass Rod . . . especially suited for high speed screw machine production.

Dehydrated Seamless Copper Tubing . . . a 99.9% pure copper pipe for coils and installation lines. Deoxidized, annealed and free from flaws. Dehydrated and sealed against moisture.

For further information address Revere Copper and Brass Incorporated, 230 Park Avenue, New York City.

Revere Copper and Brass INCORPORATED

Baltimore Division, Baltimore, Md.

Higgins Division, Detroit, Mich.

Taunton-New Bedford Division, Taunton, Mass.

Dallas Division, Chicago, Ill.

Michigan Division, Detroit, Mich.

Rome Division, Rome, N. Y.

EXECUTIVE OFFICES: NEW YORK CITY

GENERAL OFFICES: ROME, N. Y.

ACE

HARD RUBBER EQUIPMENT FOR REFRIGERATED DISPLAY CABINETS, DOOR FRAMES, SLIDE RAILS, JAMBS, GLAZING STRIPS, etc.

STANDARD AND SPECIAL SIZES AND DESIGNS

Write for information and prices to
AMERICAN HARD RUBBER CO.
13 Mercer Street New York, N. Y.
Other Sales Offices: Akron and Chicago

Frigidaire Engineer Gives Requirements Of Unit Air Conditioners

By R. E. Robillard*

Application Engineer, Frigidaire Corp., Dayton

WHILE air conditioning encompasses the functions of cooling, dehumidifying, heating, humidifying, and cleaning, many of so-called air conditioners now on the market do not attempt to perform more than one or two of these functions. There are, however, products that perform as all-year-round air conditioners—for summer as well as for winter use—and it is regarding apparatus of this sort that this paper is concerned.

Before entering into a discussion of the requirements of the unit conditioner, I believe a few moments consideration of the "why" of unit conditioner will be worth while if only to give a proper background for what follows.

Despite the success of the central plant in theatres, office buildings, industrial plants, and in many homes, it is felt that there is a need for a small unit performing the essential functions of the central plant, but of such a size and design as to permit more economical installation and operation.

Such a small unit can be used for the air conditioning singly, or in multiple for the purpose of handling the problems of homes, restaurants, large offices and commercial establishments in general.

Advantages of Unit System

The advantages of the unit conditioner are:

1. The small unit of capacity.
2. Flexibility in meeting varied requirements merely by increasing the number of units.
3. Ease of installation in old or new buildings.
4. Mobility of units as requirements change.
5. Low cost of installation because of its "package" feature.
6. Low cost of operation because of its elimination of distribution losses.

That there are limitations in the application of unit conditioners is, of course, obvious. Space requirements may prohibit, installation costs may rise, due to special construction problems or code limitations, or capacity limitations may interfere. In general, though, it may be said that the major portion of the air conditioning field is open to the unit conditioner with the odds much in its favor.

What Are Its Requirements?

What then, should the unit conditioner do, or in other words, what are the requirements for a successful unit?

Suitable capacity comes first to my mind. Too small a capacity limits the unit to only the smallest rooms, and necessitates complex installations for large rooms. Too great a capacity penalizes the average room, and brings about distribution problems which can only be solved by the use of ducts, or in other words, by using the distribution methods of the central plant.

A survey of the field for unit air conditioner (bearing in mind that it will replace in many instances the radiator now being used for heating), and a study of the load requirements indicate

air delivery at a velocity of 300 to 400 ft. per minute works out well if the direction of delivery is properly worked out.

The horizontal discharge of cooled or heated air is objectionable unless high ceilings permit of the delivery at a level well above that used by the occupants. For the floor type of conditioner the horizontal delivery is particularly bad in the small or crowded offices where a location dictated by necessity may expose a worker to a direct air stream.

Air Deflected from Vertical

And yet a horizontal flow of air is necessary if proper distribution is to be obtained. This requirement can be met by the use of a top outlet for air delivery together with a grill designed to give the needed horizontal deflection. Tests in rooms of 250 to 350 sq. ft. in floor area indicate that a deflection of the air flow 20° to 30° from the vertical will give the best results.

Space and shape requirements are not definitely fixed, nor does there seem to be a crystallized opinion amongst designers as to what they should be. My feeling in the matter is that the public

Papers Available at Nominal Charge

COPIES of papers presented at the conference on air conditioning, held last month at the Case School of Applied Science, Cleveland, may be obtained for a nominal charge by addressing the department of public information, Case School of Applied Science, Cleveland.

has already had its mind made up on the subject by the manufacturers of steam and hot water radiators, and that any design that conforms in general by what has been done by these people will satisfy the needs and requirements of most installations.

Therefore, following the practice of radiator design, the unit conditioner should be built in the long, low shape as well as the taller, narrower proportions to meet present day requirements. It does not at present appear possible to put into a package, comparable to the ordinary radiator, the mechanisms for performing the dual functions of cooling and heating and still keep the size down to that of the average steam or hot water radiator, and therefore

Table 1

Make	Rating (B.t.u. per hr.)		Dimensions		
	Cooling and Dehumidifying	Steam Heating	Length	Depth	Height
National make	8,000	29,000	38½	11½	30
Frigidaire (E3)	11,000	28,000	39¼	14	31¼
Frigidaire (V3)	11,000	28,000	28¾	14	42¾

the desirability of the following design features:

1. A capacity of 10,000 to 12,000 B.t.u. an hour for the combined cooling and dehumidifying load.
2. A capacity of 15,000 to 20,000 B.t.u. an hour for the combined heating and humidifying load.
3. An air delivery at a velocity of 300 to 400 ft. per minute for proper distribution.

Will Handle 250 to 350 Sq. Ft.

A unit with the capacities indicated above will satisfactorily condition the air of the average office, bedroom, or living room—that is, one having a floor area of from 250 to 350 sq. ft. A fine degree of summer comfort can be provided with the capacity indicated above, and ample heating capacity for winter requirements will be provided. For the exceptionally large rooms, or for installations of a commercial character, several units can be utilized without encountering a serious space problem.

Distribution of the cooling or heating effect is tied up intimately with the capacity provided or built into the unit. Small capacity means small spaces only can be handled, and naturally low air velocities will suffice for proper distribution. On the other hand, large capacity means larger spaces, and with it the problems of distribution, drafts, etc.

For what I have designated as the ideal capacity for a unit conditioner, that is, 10,000 to 12,000 B.t.u. per hour for summer cooling, and 15,000 to 20,000 B.t.u. per hour for winter heating, an

*Paper presented before the conference on air conditioning at the Case School of Applied Science, Cleveland, March 17, 1932.

dangerous electrical shock. Regardless of the voltage used for the refrigeration equipment, nothing higher than 110 volts should be permitted in and about the conditioner itself.

What has been satisfactory construction for winter conditions will not necessarily be equally so under the high humidities encountered during summer operation. Air temperatures within the conditioner will range from 50° to 65° under ordinary conditions and condensation will appear unless a double wall construction or its equivalent is used.

Safety of Refrigerant

As to the refrigerant for summer cooling, only that which gives the utmost in safety should be considered. Toxic, irritant, inflammable, or explosive refrigerants are not suitable for direct cooling in a system which, in itself, has the ability to distribute the products of a leak so quickly and so thoroughly.

There should be provision for controls to permit operation as a unit or as part of a multiple installation. Automatic controls are available for the heating end, or hand operation may be used when the cost of automatic devices becomes an item for consideration.

Refrigerant controls for summer cooling must be of a rather sensitive nature to permit operation of one or all units of a multiple system, for it is conceivable that many a home will receive its air conditioning through the medium of individual room units operated from a single compressor located in the basement, and that operation of only part of the system at a time will be desired.

Automatic Controls Appearing

Just how the many operating conditions will be met by the manufacturers selling this type of equipment is not known, but the problem is not beyond modern ingenuity. Several manufacturers have already placed equipment on the market for unit or multiple installa-

tion with controls permitting complete individual operation.

Costs must be reasonable or very few air conditioners will be sold. Costs are, however, coming down, not only because of the natural trend of the times, but because the volume of sales is increasing, and designs are being simplified. A few years ago, an air conditioning unit, for summer cooling only, together with a one-ton condensing unit, cost over \$900.

Today, a better unit, far more compact, and equipped for heating and humidifying, as well as for cooling, can be installed for as low as \$700; while a three-unit installation with a 3-ton compressor for refrigeration can be installed for as little as \$1,600.

Reach a Wide Market

These prices do not bring air conditioning within the reach of every owner of a 4-cylinder car, but they certainly reach a market that has never before considered air conditioning.

Operating costs are coming down as the power companies realize the opportunities for load building in this field, and many are revising their rate schedules to attract more home owners. Operating efficiency is being improved by the machine manufacturer and, it is not too much to hope that the difference in operating costs between winter heating and summer cooling will, in the near future, no longer act as an obstacle to the sale of air conditioning.

KOPPERS CO. BUYS CONTROL OF CORROSION RESISTANT

PITTSBURGH—Stibloy Products Co., Inc., with principal offices in the Koppers Building, here, has taken over the assets of Liquid Metal Products, Inc., Chicago, producer and distributor, under the Arent patents, of "Stibloy," a metal compound in liquid form, which acts as a primary coating to hold paint,

NEW MATERIAL DEVELOPED USING FELT-METAL BOND

PITTSBURGH—According to recent research just reported by Dr. A. W. Coffman, a new protected metal called "Robertson-Bonded Metal" (R-B-M) has been carried through the laboratory stages of development at Mellon Institute of Industrial Research. Copies of this report, giving complete information concerning this new material, may be obtained from the Mellon Institute.

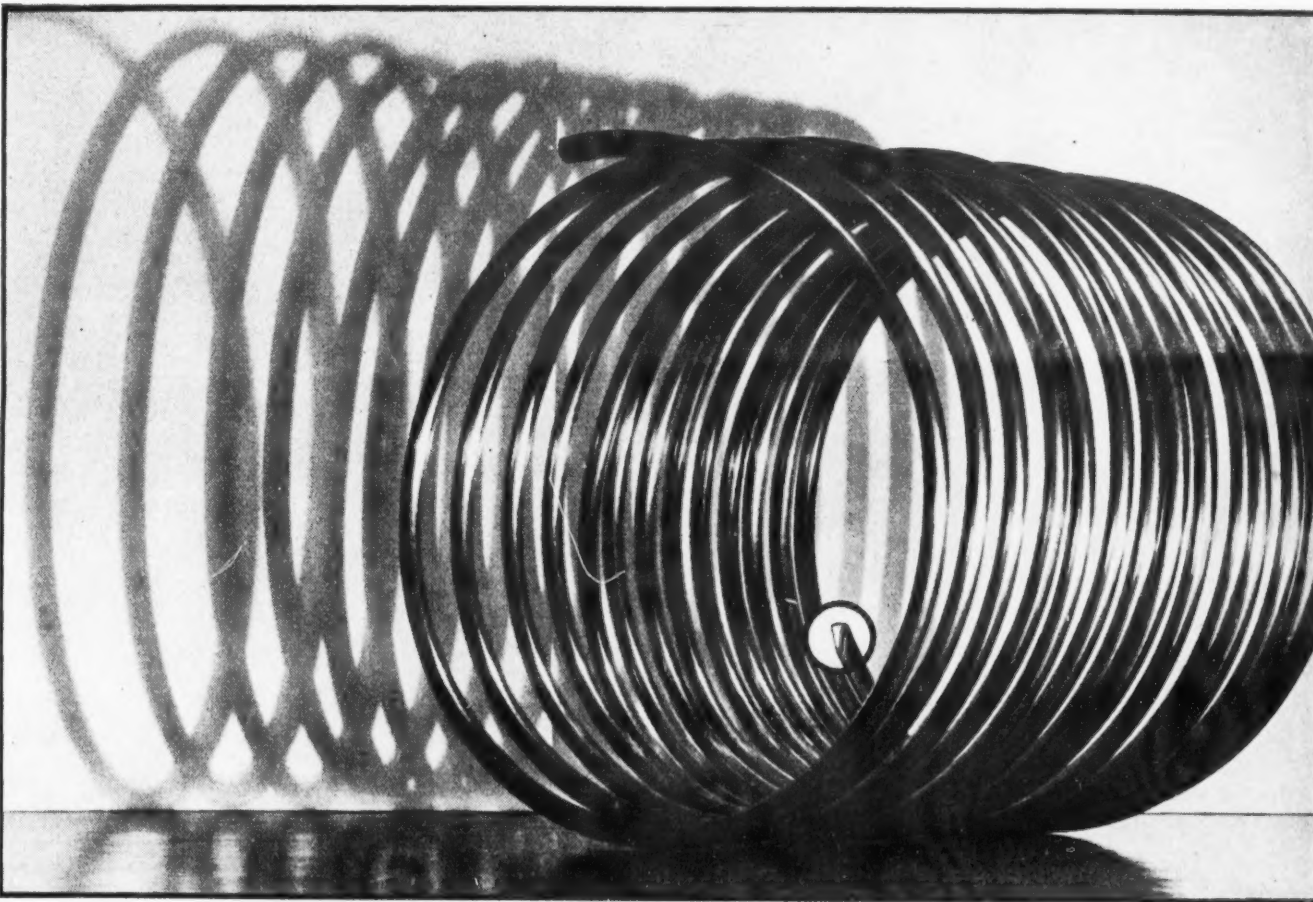
Robertson-Bonded Metal is a laminated metal-felt material in which felted materials are cemented to steel with heat and pressure, utilizing metals as adhesives. The composite laminated material, the outer surfaces of which are suitable felts, is then saturated with any desired saturant chosen with reference to the corrosive condition to which the metal is to be exposed in service, according to Dr. Coffman.

Paint, lacquer and resin films may be superimposed on the saturated felt. Owing to the fact that it is possible to choose between a number of felts and felt saturants to stand against various corrosive conditions, this new protected metal promises flexibility in providing corrosion resistance, he claims.

The ductile nature of the metal bond between felt and steel makes it possible to subject this material to forming operations such as shearing, bending, corrugating, rolling and mild drawing without destroying adhesion between felt and steel, the announcement maintains.

enamel and lacquer, and permitting immediate finishing of new galvanized metal surfaces.

Stibloy was developed to extend the life of galvanized surfaces by protecting them from the effects of atmospheric conditions and from the damage caused by exposure to gases, acid fumes, smoke and brine.



FRENCH COPPER TUBES For Dependability

French Copper Refrigeration Tubes possess the requisite properties for lasting, dependable service. *Their grain structure is uniform.* This important quality is in every coil because highest metallurgical skill and long manufacturing experience go into their production.

Interiors of French Delux Copper Refrigeration Tubes are smooth and glossy... free from oxide and foreign matter. Each coil is dehydrated, sealed, rigidly tested, and reaches you ready for use.



Stock sizes are 1/4 in., 3/8 in., 7/16 in., 1/2 in., 5/8 in. and 3/4 in., all in .035 gauge. Heavier gauges can be made to order. Stock coils are 25, 50 and 100 ft. long. Other lengths can be supplied at short notice.

For special needs we offer French Copper Tubes either open- or closed-end, dried but not dehydrated.

There are French small diameter and thin wall seamless tubes for every requirement. Your request will bring full information.

THE FRENCH MANUFACTURING COMPANY

General Office: Waterbury, Connecticut

FRENCH REFRIGERATION TUBES

Refrigeration Engineer Testifies in Chicago Code Suit

VAN DEVENTER TELLS ABOUT REFRIGERANTS

(Continued from Page 4, Column 5)

codes and regulations covering their construction and pressure tests. They are then shipped, usually shipped to the plant, where they are to be used and assembled at the plant. Approved piping is specified by the engineers and is, in all cases that I know of, used as it is required by the various codes and ordinances under which such plants are required to operate.

Q. That is, the assembling and installation of a plant covered by the first exhibit takes place at the location where it is to be used, is that right?

A. Yes, sir.

Q. Now, what is the situation with reference to the second, that is, the household unit, so-called?

Assembled at Plant

A. The household unit, as shown in Defendant's Exhibit 2, is usually assembled as a complete entity at the factory where it is made, that is to say, the compressor and the other operating parts are assembled in the household refrigerator and the only installation necessary in the large majority of these units is to connect an electric socket to an outlet.

There are some few domestic units which are water-cooled, in which case it is necessary to make a connection to the water main and to the drain pipe.

Q. Is it true that in all cases with respect to the household units the refrigerant is introduced at the factory?

A. That is almost the universal practice.

Q. What is the practice with respect to the introduction of refrigerant into the system in the case of commercial plants?

A. Invariably that is introduced after the plant has been tested and when it is ready to begin operations.

Q. In other words, I think the expression is, "in the field," is that right?

A. Yes, sir.

Q. This compressor unit shown on the third exhibit, which I take it has the same function as the compressor in the first and second exhibits,—or has what function?

A. That has the same function exactly as the compressor units shown in exhibits Nos. 1 and 2.

Compressor's Function

Q. I wanted you to state just briefly what that function is, just what does it do.

A. The compressor withdraws the gases from the evaporator and compresses these gases and discharges them into the condenser where they are cooled by the application of a draft of air or by water.

Q. Is that a pressure-imposing element?

A. It is.

Q. Well, now, what is the refrigerant used, commonly used, in the commercial ice plants?

A. Ammonia.

Q. Is that generally so, that is, can you give us any—

A. I would say 95 per cent of the existing commercial systems of refrigerant all over the world employ ammonia as a refrigerant.

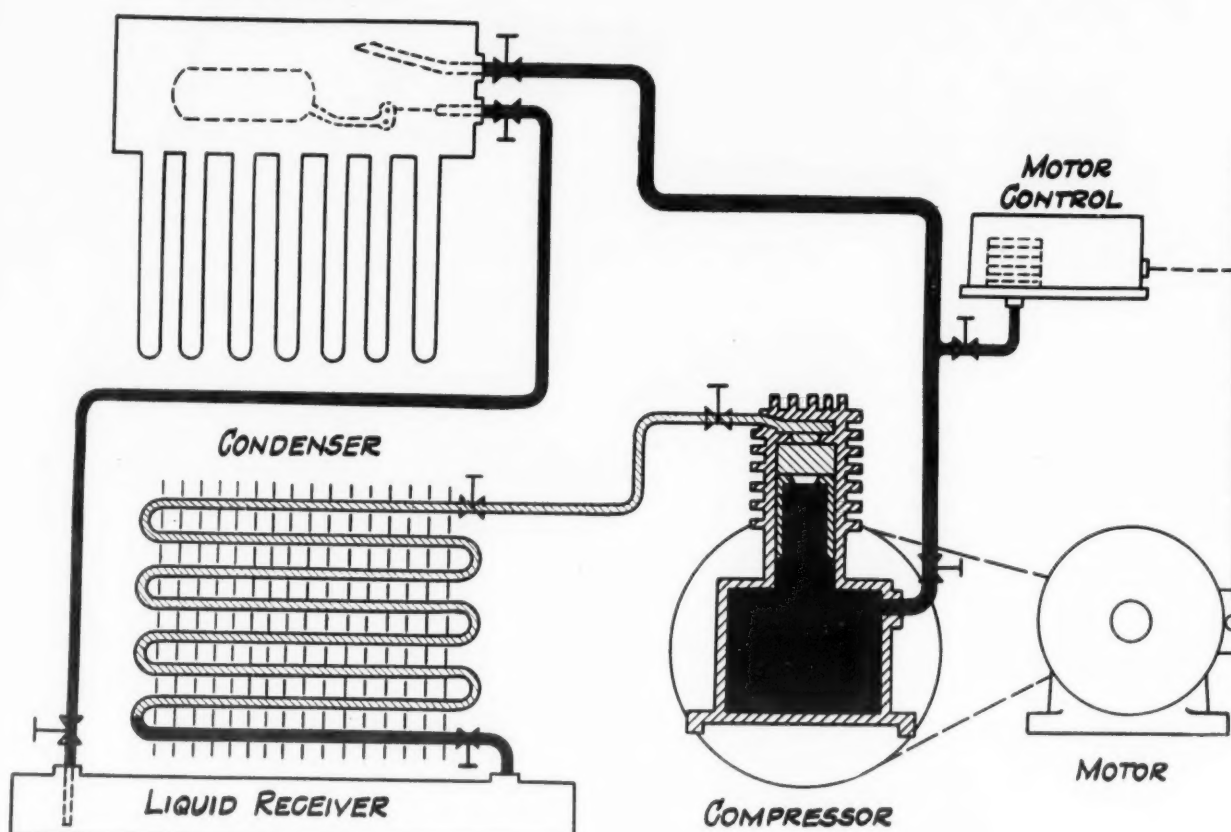
Q. Do any of the household units employ ammonia as a refrigerant?

A. None that I know of, of the compression types.

Q. Well, those in common use today, such as General Electric, Frigidaire, Kelvinator, Copeland—I don't know whether I can name them all or not—do any of those use ammonia?

A. They do not. The only household re-

Elements of a Household Refrigerator



SIMPLIFIED FLOW-DIAGRAM OF A SMALL HOUSEHOLD REFRIGERATING UNIT

Exhibit 2—Diagrammatic sketch of a household refrigerator, showing its cycle of operation.

frigerator that I know of using ammonia is an absorption machine made by the Servel Corp.

Q. Now, you may state the properties of ammonia with respect to flammability or explosiveness; I mean, is it flammable or explosive?

A. That would depend largely on the conditions of use. Ammonia, per se, not confined and in a pure state is difficult to explode below a temperature of 900°. But, the mixture existing within the average large refrigeration plant is not pure ammonia. It almost invariably contains certain oil vapors.

It is my opinion, as the result of some tests and observations, that the mixture in the average large refrigeration plant will explode under conditions where the oil content of the vapors becomes ignited, thereby raising the temperature above the critical point for the ammonia explosion, and thereby setting the ammonia off.

In other words, we have a condition which is very much like the little detonator cap in a cartridge, you first fire the cap and that fires the powder charge in the cartridge, or shell.

The elements of danger in a large ammonia plant are almost directly in proportion to the amount of the refrigerant employed, and the size of the various pressure

vessels in which amounts of ammonia vapor are stored.

Q. Now, you have covered the element of explosiveness when mixed with oil. What is the situation as to flammability of ammonia in a commercial refrigerating ice plant system?

Characteristics of Ammonia

A. The condition there in respect to the vapors which I have referred to also applies. The vapor from a large plant, escaping in a closed room, will take fire and burn. The rate of flame propagation depends entirely on the density of the gas, quality of the gas and numerous other factors which would have to be known before anyone could state definitely whether that was a flammable mixture or not.

But, anyone who has seen a fire caused by that condition knows that it is most peculiar; you will have fire go around the sides of the room, it will go wherever there are patches of vapor which have that particular quality which makes it flammable at that time. That depends on the admixture of air and the oil content of the vapor.

Q. If I understand you correctly, the ammonia escaping from the system and mixed with air in proper proportion is flammable, is that it?

A. That is a point on which all the authorities agree.

Mr. Bourland: I agree to strike it out.

Mr. Wermuth: Yes, strike it out.

Q. Either answer it yes or no, if you please.

A. Yes.

Q. Is there a percentage, or are you acquainted with the percentage under which such a flammable condition would occur? I have in mind the mixture of the air with the vapor.

A. Yes, it varies from about 13 to 26 per cent in volume.

Q. Now, ammonia also is an irritant, is it, or what do you call it? I have in mind now its effect on persons.

A. The worst situation with which one is confronted in connection with a large quantity of ammonia getting loose is the fear—

Mr. Bourland: Just a moment, I object to that and move that it be stricken out.

Mr. Wermuth: Read it.

(The answer was thereupon read.)

Mr. Bourland: I will withdraw the objection. Go ahead.

Mr. Wermuth: Go ahead.

A.—is the fear—everyone who has had any experience with ammonia knows how highly irritating it is.

Q. In what way is it irritating?

A. Well, the throat almost immediately closes up. You cannot breathe the ammonia for any appreciable length of time if it is present in any considerable quantity.

If you are a very experienced man and you get caught in connection with the ammonia explosion, you can get down on the floor and maybe make your way on your hands and knees to an exit. But, I think it is fairly safe to state that if it was present in any reasonable concentration, that a man could not walk 50 to 100 ft. through it without a gas mask.

Q. Now, a moment ago you pointed out that generally ammonia was not used in household machines. Now, do you know the reason, if there is one or more?

A. The refrigerating characteristics of each one of the gases used, such as ammonia, sulphur dioxide, ethyl and methyl chloride, differ.

A household machine designed to produce say the equivalent of 100 lbs. of refrigerating, ice-melting effect, in 24 hours, would have a circulating stage, a very small quantity of ammonia, something on the order of 3½ to 4 oz., that the construction of the expansion valve and the compressor would be exceedingly difficult.

It is also difficult to condense ammonia with air-cooling alone. You must use water

mosphere—assume we have a water temperature of 80°, the head pressure in an ammonia system would be about 180 lbs. Now, if we had cooling air of 80° with a sulphur dioxide system, which is in common use in household machines, the pressure would be of the order of 80 lbs. I can give it to you exactly if you want me to do so, from the standard tables.

Q. Yes, if you will, so we will have it accurately.

A. At a pressure of 80°—

Mr. Bourland: I object to the use of any tables which have not been identified, which apparently he has not prepared.

Mr. Wermuth: Q. Are you able to refresh your recollection from any data that you have on that subject?

A. Yes.

Mr. Bourland: He has not said it was necessary to refresh his recollection as yet.

Mr. Wermuth: Q. Can you give us any more definite answers than you have?

Cites Textbooks

A. I can, if you will let me refer to any standard gas table which gives the pressure of refrigeration gases at various temperatures.

Q. Have you such a standard table here?

A. I have.

Q. In what form is it, in what book?

A. I will find it in McIntyre. Off the record a minute.

(Thereupon certain discussion ensued which was stated to be not for the record.)

Mr. Wermuth: Q. If you have not got it handy, we can pass it for the moment.

A. I now refer you to the temperature-pressure curves for refrigerants on page 61 of a book entitled, "Household Refrigeration," by H. B. Hull, and find that for a temperature—

Mr. Bourland: Just a minute. I object to that.

Mr. Wermuth: You don't believe in Mr. Hull?

Mr. Bourland: I don't know Mr. Hull.

Mr. Wermuth: Q. Who is Mr. Hull?

A. Mr. Hull is a refrigeration engineer, rather prominently identified with the industry, and at present is connected with the Frigidaire Corp. of Dayton, Ohio.

Q. Are you able now, after your inspection of the data which you have made, are you able to testify independently of any books?

A. I believe I said at a temperature of 80° that sulphur dioxide would have a pressure of about 80 lbs. I find out that at 80° the pressure of sulphur dioxide is 60 lbs., or about one-third that of ammonia, which is exactly 155 lbs. at 80°.

Mr. Bourland: 155°?

A. It is about 155 lbs. I cannot see the exact cross-line in this table here.

Mr. Wermuth: Q. Do you know about the number of lbs. of ammonia per ton

(Continued on Page 8, Column 1)

Multiple Installation

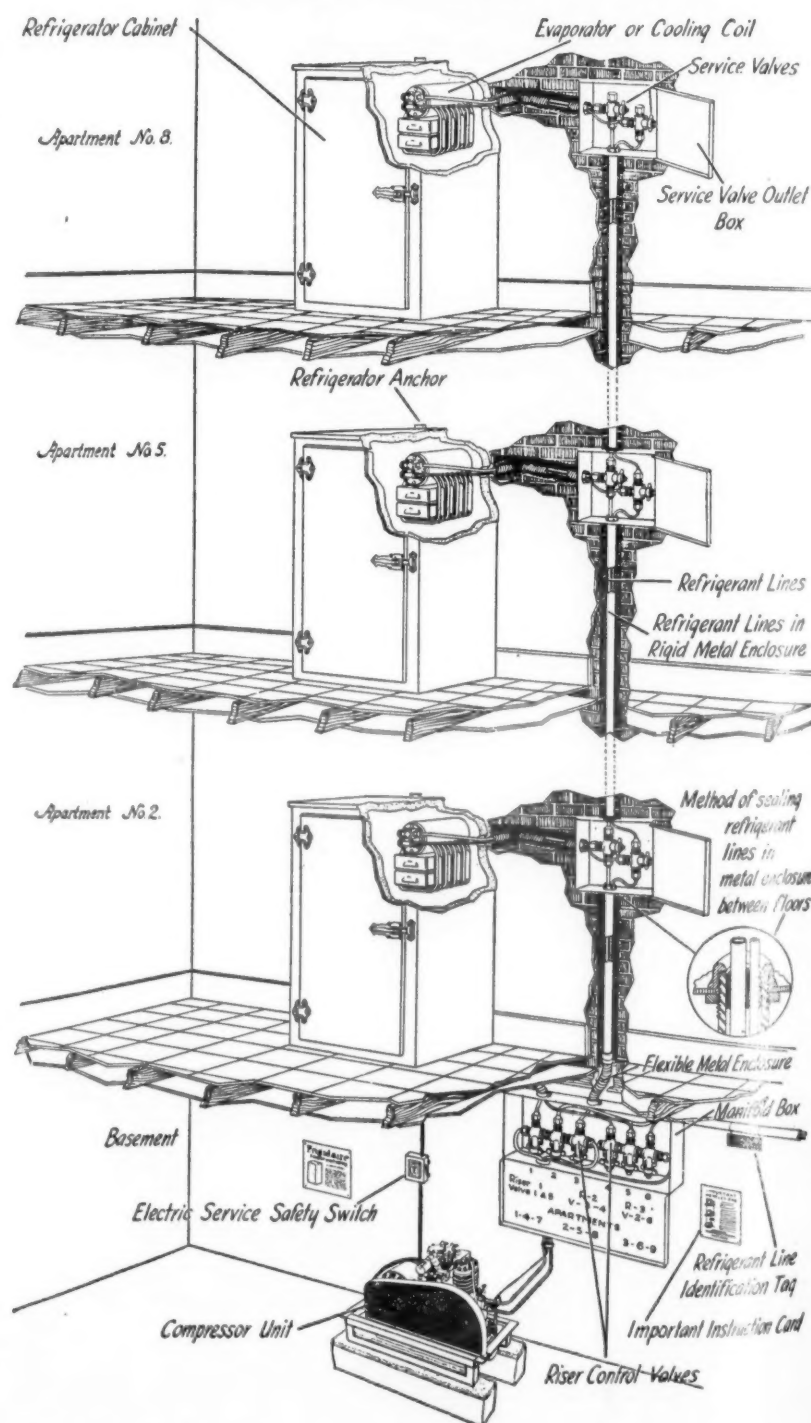
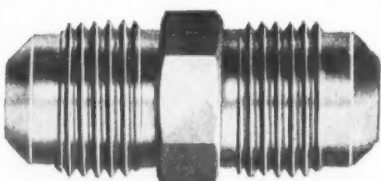


Exhibit 3—Installation of multiple units on three different levels.



BUILT RIGHT—TO STAY TIGHT

EXTRA HEAVY FITTINGS

INCLUDED in the Commonwealth line of fittings for the automatic refrigeration industry is a complete list of extra heavy pieces, regularly carried in stock for prompt shipment.

All Commonwealth fittings are seepage-proof, accurately machined and carefully designed for maximum service.

Packed so as to reach the user with every tube seat protected in shipping, Commonwealth fittings save labor costs in installation.

COMMONWEALTH BRASS CORPORATION
COMMONWEALTH AT G. I. R. R.
DETROIT, MICHIGAN

Send for a copy of our catalog No. 36, fully descriptive of our complete line of stock fittings.

George Bright Makes Recommendations For Operating Large Plants

By George B. Bright*
President, George B. Bright Co., Detroit, Mich.

ASSUMING that all plants are properly designed and constructed, and that they are all inherently dangerous by reason of the fact that they operate under pressure and employ some kind of a refrigerant, there are certain safety practices which should be followed in the operation and maintenance of both domestic and industrial refrigeration systems.

In order to deal intelligently with this subject, refrigerating systems should be considered for three distinct and separate uses, as follows:

1. Industrial refrigerating plants, used in the manufacture or processing of materials, such as ice-making plants, cold storage warehouses, ice cream plants, dairy plants, packing houses, chemical plants, and other places of similar industrial enterprise.
2. Commercial refrigerating or air conditioning plants, used in commercial or business places, such as meat markets, stores, florist shops, hotels, office buildings, restaurants, candy shops, bakeries, and other places of similar commercial enterprise.
3. Domestic or household use—any refrigerating system assembled or installed in a single residence, duplex, or apartment dwelling.

Industrial Plants

Refrigerating plants in the industrial group, while some of them contain many thousands of pounds of refrigerant, do not present any great hazard—due to the fact that they are usually in charge of a skilled operator, and, further, any great loss of refrigerant would prove costly from a renewal standpoint as well as impair the operating efficiency.

Most industrial plants are so located that they are not hazardous, except to workmen employed directly within them. Where the public comes in close contact with such plants, it is usually some place remote from any part of the refrigerating system.

Some suggestions for operation and maintenance for industrial plants, are as follows:

Operating Suggestions

Check pressure gauges often, at least every 10 days, to be sure they are registering proper pressure.

Every refrigerating plant should have the following thermometers:

1. In the liquid line between condenser and receiver.
2. In the suction line to each compressor or absorber.
3. In the discharge from each compressor or generator.

The thermometer in the liquid line is the best check as to proper condensing pressure. If corresponding pressure of condenser is not close to that shown for the temperature of the liquid leaving the condenser, then it is evident that there is air in the condenser or the condenser is dirty. This also applies when the temperature of the liquid leaving the condenser is more than a few degrees above the outlet water temperature from condenser.

Suction Line Thermometers

Thermometers in the suction lines should never show in excess of 5° to 8° F. above that of the corresponding back pressure, and never below. If above, it shows suction superheat and that all of the low side surface is not being used to the best advantage.

If below the corresponding temperature, it shows that too much liquid is being fed to the low side, which results in freezing back to the compressor or absorber, also some danger of liquid shocks to the compressor.

The thermometers in the discharge lines should show a temperature to correspond with that of the condensing pressure and superheat. If below, shows that sub-cooling is taking place either by liquid being fed into the cylinder or excess water jacket cooling is taking place. If above the corresponding pressure and superheat, the excess is sometimes caused by leaky valves, piston or undue mechanical friction.

Superheat Relationship

There is a fixed relation between suction superheat and discharge superheat, depending on the refrigerant used.

All pipe connections should be kept tight and free from vibration. It should be remembered that no leak will ever take up with a refrigerant, no matter how small it is.

Keep refrigerant free from oil and foul gas by purging system.

Be sure that every pressure vessel that can be shut off is equipped with a pop safety valve of "Code" size and setting and that it is in proper working condition. If there is a stop valve between vessel and safety valve, be sure that it is open. Most of the accidents of pressure vessels failing are due to safety valves being out of commission. Some operators make it a practice to note safety valve inspection at least once a week on their log sheets.

Where plants are equipped with devices to stop the compressors, by means

of pressure limiting device, the same should be checked and tested at least once a month.

Keep all valves and lines marked so that in case of emergency it would be easy to transfer refrigerant or shut off any part readily by reference to labeled lines and valves. Where more than one compressor is used, it is well to designate them by numbers, then follow some system of numbering valves, such as No. 1 suction valve, Nos. 2, and 4, discharge valve, etc. Where it is necessary to close such valves, a warning tag should be placed on same, calling attention that the valve is closed. Also tag should be placed on starting switch, calling attention to it being necessary to open discharge valve before starting compressor or discharge of pump whichever the case may be.

In shutting down a compressor, the suction stop valves should always be closed and never opened until machine is up to desired speed when started again; then the opening should be gradual to be sure that no entrained liquid is drawn from lines into compressor suddenly.

Check Before Operating Valves

Never open or close a valve in a refrigerating system until after you have made a check as to what will happen if you do. Many accidents have been caused by opening of a valve allowing liquid to flow into compressor suddenly, and wrecking the compressor.

Keep all bolts and nuts free from rust and oxidation by using some protective such as graphite and cylinder oil. This is also an excellent protector for valve stems.

Keep a full charge of refrigerant in the system at all times. Anything less than a full charge means the plant is operating at low efficiency on the evaporating surface.

Check Brine Density

Keep brine to proper density, as a weak solution will freeze on the evaporator, and is also far more corrosive.

Keep brine solution as near neutral as possible or slightly alkaline. Acid or strong alkaline brine causes pitting and corrosion.

If electrolysis appears, check brine system over for bronze or brass fittings. Sometimes, a bronze impeller in a pump has been known to ruin all the cast or steel fittings in a brine system.

Brine treatment recommended by A. S. R. E. Corrosion Report.

Keep condenser clean and free from scale. This adds to the efficiency as well as prevents deterioration of tubes or pipe.

Keep frost and ice off of cooling coils, where it is possible to defrost. Some ice plant operators make it a point to defrost ice storage room coils in sections just before the summer season sets in. This is done by placing canvas over ice and defrosting one section at a time.

Stresses Neatness

Keep tools, such as wrenches for compressor, stuffing box and valve glands, handy at all times. A neat tool board is very useful for this.

Keep gas mask in operating condition. Operator should have monthly "gas mask drill"—this always means proper use and condition.

If necessary to remove refrigerant from system, it should always be placed in suitable container in accordance with regulations, or discharged with suitable absorbent.

Refrigerating plants of the commercial group present an entirely different problem to that of the industrial plant, for two reasons:

1. Many plants are not operated by skilled operators. In a great many cases, the operator knows little about refrigeration.

2. It is the commercial group where the public is subjected to the dangers and hazards of refrigeration by virtue of the fact that they are constantly in such places.

Operation of Commercial Units

Some suggestions for safe practice in operating and maintenance of commercial refrigeration systems follow:

The person in charge of the system should become familiar with the system and the various parts.

The suction and discharge pressures should be observed frequently during the day. Where systems do not have pressure gauges, then the suction and discharge can be observed by placing hand on the pipe. If pressures or temperatures do not correspond to that recommended, call a service man.

Where systems are manually operated, be sure to follow instructions for start-

ing and stopping the same. If automatic, do not tamper with controls—better call an expert service man and be sure.

Do not use sharp instruments in removing frost or ice from low side. Many evaporators or low sides are made of thin copper tubing and are easily punctured.

Call Service Man for Leaks

In the event of a leak, call a service man immediately.

Domestic refrigeration presents an entirely different problem from either industrial or commercial systems.

Some safe practices recommended for domestic use in single homes, are as follows:

Obtain the following information and place on a card, and keep near the refrigerator in a convenient place for use in case of emergency:

The name and correct chemical formula of the refrigerant used.

If refrigerant contains a warning agent, the name and correct formula of same.

The name, address, day and night telephone number of service man.

Regular Defrosting

Keep the cooling unit in the refrigerator free from ice. This can be done by defrosting at regular intervals. It is better to defrost before any ice accumulates, as a light coating of frost will melt away in a few hours; where, when evaporator surface and tray sleeve become covered with ice, it is necessary to defrost all day and sometimes all night.

After defrosting, wipe out tray sleeve with a cloth—this will prevent trays from freezing fast.

One of the common causes of leaks, is by unnecessary damage done in removing frozen-in ice trays.

Don't tamper with any of the controls—call a service man.

A careful checkup of 54 accidents reported in a number of ice plants reveals that only one accident was caused by reason of the refrigerant.

In that case the operator opened an oil drain valve wide and was burned by ammonia before he could close the same. This was purely neglect on the part of the operator by carelessly opening a valve on a system under pressure.

Avoid Carelessness

Most of the accidents of recent years in the large industrial systems that have come under my observation, have been due entirely to the careless use of the equipment.

A brine cooler in Detroit blew up when filled with liquid and the inlet and outlet valves were closed; also the stop-valve between the pop safety valve was closed.

In another case, a large quantity of ammonia was discharged from a plant that drove the people out of buildings half a block away, when a discharge line made of light weight broke. Nothing would have happened beyond the plant if the bypass on check valves had not been left open, with the result that several thousand pounds of refrigerant was lost—whereas less than 100 lbs. would have been lost if the check valve bypass had not been left open.

Urges Attention to Codes

Two other places reported accidents due to stop valves being closed and pressure did not relieve through safety valve. The A. S. A. Code provides that no stop valve will be permitted between pressure vessel and safety valve.

It is believed that much trouble and many accidents will happen unless some precautions are taken to have all refrigerating systems designed and constructed in conformity to a code, and installations made only by competent workmen licensed by the state or municipality having jurisdiction.

COMMERCIAL COIL BRINGS OUT 'RADIAL' EVAPORATOR

CHICAGO—Complete information has just been released on the new "Radial" commercial evaporator coils of the Commercial Coil and Refrigeration Co., located here.

The new cooling coils employ round copper fins on copper tubing, and according to claims of the designers, need a surface area equal to only 50 per cent of the surface of the cabinet refrigerated to secure non-frosting coil operation with a temperature range from 36 to 42° F.

Dehydrated seamless copper tubing, with 3/4-in. outside diameter, is used for sulphur dioxide, methyl chloride, and F-12, while seamless steel tubing is used in coils for ammonia work. The coils are built for direct expansion, and are provided with 1/2-in. flares and nuts.

The coils are designed so that the installation department can build up many different coils from an inventory of a few base sizes, it is claimed, because 10 fixed dimensions have been established for all but two of the coils.

With the 158 standard sizes, a total of some 10,000 combination coils can be assembled on the job or in the shop, according to the announcement.

A manual has just been published by the Commercial Coil and Refrigeration Co. providing tables for estimating.

Refrigerating Engineer Defines Terms Humidity, Relative Humidity

By Arch Black
Service Director, Liquid Cooler Corp.

WHAT is Humidity? How fashionable it is becoming and as summer approaches and more home air conditioners are installed, how often this question will be asked by housewives. True, the simple definition would be a degree of dampness, but the average service man knows that this won't be sufficient for an answer to the majority of new owners of air conditioners.

Most of us at some time or other have undergone severe questioning about the new household box or the commercial plant being installed, and will admit many questions required very intelligent answers. With the air conditioning field opening rapidly, it is surely necessary that we prepare ourselves for the onslaught of questions that may be expected from prospective and new owners of air conditioning plants.

Questions about humidity and relative humidity are bound to be common for they are fast becoming household words. Most people during summer have undergone that uncomfortable and sticky feeling and realize that it is caused from humidity, but let us find out where and why it originates.

Air consists principally of nitrogen, oxygen and aqueous vapor. Between the molecules of the two gases, nitrogen and oxygen, which are the chief components of dry air, minute particles of water are floating which have risen into the atmosphere in the form of vapor.

This vapor is continually rising from water and other moist surfaces by evaporation. Evaporation also takes place from snow and ice. Because of the transparency of these minute particles of water in the atmosphere, they are usually invisible. The quantity of dry air in the atmosphere remains constant, due to the fact that dry air does not change its gaseous state—but such is not the case with aqueous vapor.

By the process of evaporation and condensation, the quantity of vapor in the atmosphere is constantly changing,

and although where visible water vapor is in a state presenting some resemblance to that of a gas, nevertheless it can be turned into water and back again from the liquid to the invisible gaseous state.

Possibly it may be well to mention here that the general term vaporization is used to indicate the process of transition of a liquid to a gaseous state. The term evaporation refers especially to the slow generation of vapor at the free surface of a liquid or other moist surface.

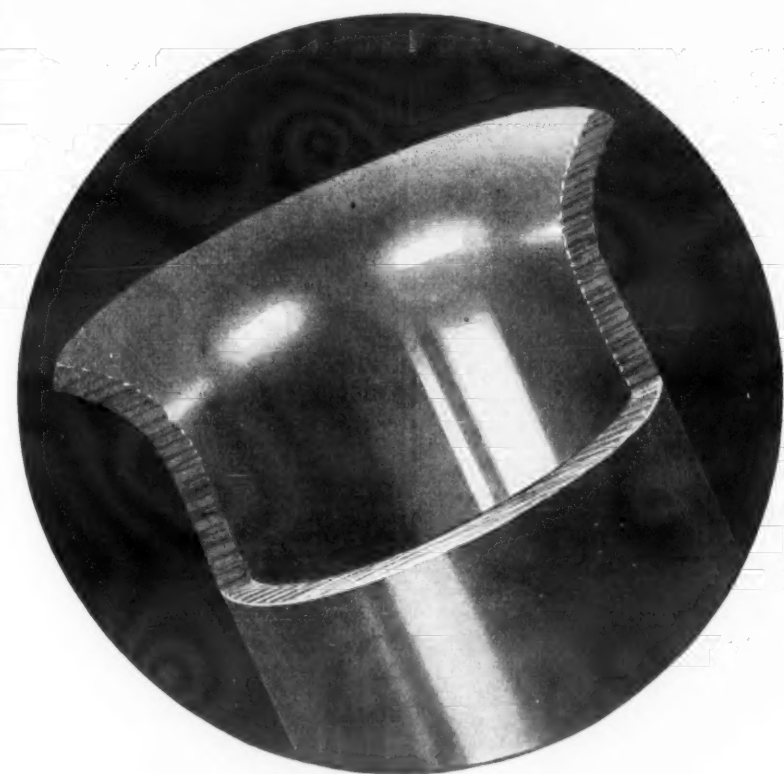
The pressure of all gases when in an enclosed space is increased by a rise of temperature, and diminished by a fall of temperature. As the temperature rises the capacity of space for holding moisture increases, and as it falls this capacity decreases; therefore the warmer the air, the larger quantity of moisture can it sustain in an invisible state.

In a definite volume of air, only a limited quantity of water-vapor can be held in suspension in an invisible state; when this limit is exceeded, particles of water are formed which become visible as cloud, fog, or mist. When air with its full load of moisture undergoes a temperature reduction, its excess moisture is precipitated in the form of rain, snow or hail.

At all times air contains some water-vapor in suspension. The quantity of vapor it is capable of sustaining is entirely dependent upon the temperature. The higher the temperature the greater the capacity of the air for moisture.

When air contains its largest possible quantity of vapor it is said to be saturated. Referring this to a 0 to 100 scale, 0 representing perfectly dry air and 100 representing saturation, the quantity of moisture in the air can be expressed in figures as a percentage of the amount necessary to produce saturation, the temperature remaining the same. This proportion of moisture to saturation is known as relative humidity.

Everlastingly - - -



- - one solid, seamless, copper tube

not a crack, a flaw, or weak spot. Work it any way—swedge, flare, bend—it is perfect and stays that way. For refrigerants, water, air, oil—the cheapest—and best.

Dehydrated and Sealed Coils

Made to A. S. T. M. specifications (B68-30T). Plain or tin plated. Prompt shipment.

WOLVERINE TUBE CO.
SEAMLESS COPPER BRASS & ALUMINUM

1491 Central Ave.

Phone Vinewood 1-5000

Detroit, Mich.

Export Department—H. M. Robins Company, 120 Madison Ave., Detroit, U. S. A.
Cable Address: Robns, Detroit.

Sales offices in 26 cities. Stock available at Los Angeles, 224 E. 11th St. Write or wire for name of nearest representative.

*Paper presented before the Refrigeration Section of the National Safety Council.

Very Few Accidents from Household Units

COMPARES DOMESTIC, INDUSTRIAL SYSTEMS

(Continued from Page 6, Column 5)
which is employed by the average commercial ice plant?
A. That will vary from 25 to 50 lbs., but—
Q. Upon what does it depend, upon what does the variation depend?

Varies with Size of Plant

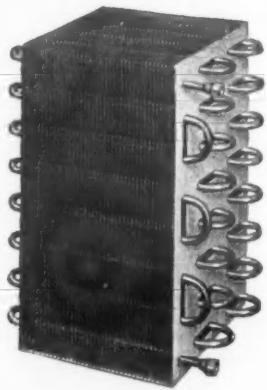
A. The cubic capacity of the various tanks, the size of compressor and the amount of piping in the system.
Q. Do the liquid receivers have anything to do with it?
A. Yes, that is one of the tanks.
Q. In fact, all of the elements of the system will have its effect?
A. All of the elements of the system. You may have 25 lbs. per ton, you may have several hundred lbs. per ton.
Mr. Bourland: I assume you are referring to ton of refrigerating or ice-making?
A. Per ton of refrigeration.
Mr. Wermuth: Q. Now, about how many lbs., or per ton, of refrigeration, of the refrigerator, has any household machine? When I say household machine, I don't mean multiple system; I mean the ordinary, single-unit system.
A. About three lbs. to four lbs.
Mr. Bourland: Q. Refrigerant or what—how many lbs. of refrigeration or tons of refrigeration—what are you referring to?
A. Refrigerant, that is what I understood the question to be.
Mr. Wermuth: Mr. Gearon pointed out to me that my question was a little bit ambiguous.

Uses 3 to 4 Lbs. of Refrigerant

Q. What is the total number of lbs. of refrigerant in the household system?
A. From 3 to 4 lbs. in the unit system.
Q. Is that clear?
Mr. Bourland: I thought you were asking in comparison to the amount of refrigeration produced. If you are not asking that, that is all right.
Mr. Wermuth: No.
Q. What about the multiple system, as to the amount of refrigeration?
A. The average multiple system, they allow about 3 lbs. of refrigerant per evaporator, plus from 4 to 5 lbs. as the system as a whole.
Q. Now, does the amount of refrigerant in the system bear any relation to its hazard?
A. Yes, sir.
Q. As to fire, for example?
A. Yes, sir.
Q. Or explosion?
A. Yes, sir.
Q. Just tell us about that without attempting, without my attempting to ask you the questions.
A. The hazard to life and property in any refrigeration system may be considered to be almost in direct proportion to the amount of refrigerant employed.
The situation is almost analogous to that

SPECIALIZING
in
REFRIGERATION CASTINGS
made of
ELECTRIC FURNACE IRON
or
SEMI-STEEL and GREY IRON ALLOYS
The Superior Foundry Co.
Cleveland, O.
Metallurgical Advice Grátis

A New Fin Coil by PEERLESS



A distinctive advance in fin coils at a new LOW PRICE!

Individual fins — Wedge-Locked and Edge-Locked.

Constructed of full length tubing—(copper or aluminum)—eliminating the many soldered return bend connections.

Absolute metal to metal contact—fin to tubing—accomplished under tremendous pressure by automatic machinery.

A fin coil for every type of box, counter or cabinet manufactured—at a saving to you!

SO₂—Methyl Chloride—F-12.

Write—Wire for the PEERLESS FIN COIL Catalog!

PEERLESS ICE MACHINE COMPANY
515 W. 35th St. Chicago, U. S. A.

where a man goes down and buys one pint of gasoline, he takes that and stores it in his house, no one pays much attention to it. But, if he attempts to store a thousand gals. of gasoline in his house, the city steps in and tells him what he must do in order to safeguard life and property because of the potential danger in connection with a thousand gals. of gasoline getting loose is almost in direct proportion, as between the pint and the thousand gals.

It is the same way in connection with refrigeration systems. If you take any refrigerant, gas, with the exception of CO₂, and turn a quantity of it loose, it constitutes a hazard and that hazard is almost in direct proportion to the quantity of the gas.
Q. In your opinion, is it possible to compare the hazard in the household unit with the hazard in the commercial ice plant?

A. Not at all. I think that it is entirely improper to compare the household refrigerator with a manufacturing plant for making ice or producing cold storage.

Regarded as Household Appliance

The household unit is essentially a domestic appliance. It is something that is used in the kitchen and if you want to compare the hazard to life under ordinary conditions of use, you should compare it with a gas stove or the vacuum cleaner, or some other domestic appliance in common use.

Q. Now, in size, physical size, would you compare a household unit with a commercial ice plant—what I am getting at is, from these drawings, for example, No. 2, the scale on that and the scale on No. 1 might lead one to believe that they are both the same size. I want you to tell me just briefly and generally how large is the ordinary household unit, physically.

Describes Average Unit

A. The average household unit may be said to comprise a refrigerator cabinet which may be 5 ft., 6 in. tall, 3 ft. deep and 4 ft. wide. That cabinet would have a food storage space of approximately 5 cu. ft. It would contain the complete refrigeration apparatus comprising the condenser, evaporator, compressor, controls and electric motor for driving the compressor, and ice trays, and would be complete, ready for use.

This is the system shown in Defendant's Exhibit No. 2. The plant for making ice or producing cold storage would, in the first place, comprise a large room or a building, and in that the various elements shown in Defendant's Exhibit No. 1 would be assembled and piped up. A fair basis of comparison and the relative size is the compressors, the pressure-imposing elements—in the household unit the pressure-imposing element is a small machine that may weigh from 40 to 60 lbs. It is seldom over 18 in. high or 16 in. wide and perhaps 8 in. thick on the base.

100-ton Ice-making Plant

The pressure-imposing element in a 100-ton ice plant would—
Q. You mean, capable of producing 100 tons of ice per 24 hours?

A. Capable of producing 100 tons of refrigeration, or 160 tons of refrigeration and 100 tons of ice—I think at this point I might say that in speaking of standard tons of refrigeration, I refer to 288,000 B.T.U.'s in 24 hours. The ice-making capacity would be approximately 60 per cent of this figure. The pressure-imposing element in such an ice-plant, would, without auxiliary equipment, probably weigh 17,000 lbs.

Q. Now, you have, have you here, a pressure-imposing element of the household unit type?

A. Yes, sir.
Q. Will you exhibit that to the Master, just to help him get the picture? Will you explain briefly the operation of a compressor in a household unit?

Mr. Bourland: Do it without reference to this machine.
Mr. Wermuth: Q. In other words, we are not putting this machine in evidence; you can illustrate as you talk.

A. The compressor being connected, as shown in that diagram, Defendant's Exhibit 2, the hot gas which has absorbed the

heat from the top of the box in the food compartment where the ice trays are located, is drawn back by the operation of the pistons and taken in above the piston and when the piston goes upward in the cylinder, in the case of a vertical compressor, it is compressed until the discharge valve at the top of the cylinder opens and allows the compressed gas to escape, and it passes out from the top of the compressor and over into the condenser or cooling coil.

In the case of a household refrigerator, that cooling coil is commonly placed in front of the flywheel exactly the same as the radiator of an automobile, and the flywheel of the compressor is provided with fan blades which blow a draft of air over that coil and cool it. That causes the hot compressed gas that is in there to give up its heat to the air, and that heat is blown away and disposed of and that liquid which remains behind is then sent back to the coil in the upper part of the box and has, as all refrigerants have, the ability to absorb a definite amount of heat per lb. of refrigerant circulated and it does that. Whereupon it is then drawn back to the compressor and re-compressed.

Q. This compressor is made to run by what, a fan belt from a motor or gears or what?

A. This compressor here is driven by means of a V-belt from a 1-6 to a 1/4-hp. electric motor.

Q. Is it generally true that the compressors are driven by a belt from the motor, or do some of them operate through gears, or just how?

Majority Use Belt Drive

A. There are a few gear-driven machines in the prior art, but the large majority of the compressors are belt-driven.

There is a type of direct-connected compressor which is driven at motor speed, that is to say, the piston element is directly mounted on the motor shaft.

Q. Now, this compressor is for the purpose of making pressure, isn't it?

A. Yes, sir.

Q. Explain it, its effect on a refrigerator.
A. I have tried to deal with this question of handling the refrigerant in the cycle in as non-technical a way as possible, and in order to do so, will say that every refrigerant gas or every refrigerant has a certain quality known as latent heat.

That can best be illustrated by the fact that if I have a pound of ice here on the table and I build a fire under it and start to melt it, that ice remains at 32° F. until the last piece of it is gone. If it took me two minutes to heat it and change it from ice to water, I certainly put a lot of heat into it, but it is not sensible heat. It takes 144 British Thermal Units to melt that pound of ice into water at 32°. From then on the water begins to get on—in other words, the heat becomes sensible heat, you can feel it, and if I raise that temperature degrees I put 50 more B.T.U.'s per pound water in there to raise it.

Explains Latent Heat

Now, if you take refrigerant into the expansion coil, which is in the top of the household box where you make ice, you have in the storage compartment various foods, each one of which is giving off or will give off heat, if you put something in there that is cooler than they are. So, by means of the expansion valve, you reduce the pressure of the incoming refrigerant—the expansion valve could really be a little pin-hole in the pipe somewhere—and you let the liquid refrigerant squirt through that pin-hole, you reduce the pressure, because this pressure is sucking on the tank or coil in the upper part of the box and the pressure in there is reduced. It sucks this refrigerant through the pin-hole and it expands, as it were. In that expanding it has lost its pressure, which it got from the compressor here, and it has gone into this tank and the heat units are being absorbed in the gas. You get an absorption in there which is equal to the latent heat of the refrigerant minus certain differences there, dependent on pressure and temperature relations, which I need not go into for the sake of this illustration.

This gas then becomes hot, bearing in mind that heat is a relative term, but it is hotter than it was when it first went into this chamber at the top of the box, and each cubic foot of this gas has absorbed so much heat, depending on what that gas is.

Condenser Principle

Now, these gases have the peculiar quality that if you squeeze that up, that is to say, put pressure on them and change their bulk and at the same time apply a cooling medium such as water or air, they will then give up their heat and become cool and liquefy.

Q. Is that the reason you have to have pressure?

A. That is the reason you have to have pressure, and the reason you have to have at the same time a cooling medium present. Then when you cool them and compress them and they liquefy, the latent heat is again usable, and if they are passed through the expansion valve and go into the evaporator, the cycle I have just described goes on again.

(And thereupon a short recess was taken.)
Mr. Wermuth: I did not offer Defendant's Exhibit 3, of which you have a copy. I offer it now.

Mr. Bourland: No objection.

The Master: It may be admitted.
(Which said document, so offered and received in evidence by the Master as aforesaid, was marked Defendant's Exhibit 3, and made a part of the record in this case.)

Mr. Wermuth: Q. Can you trace briefly the history and the evolution of the art of refrigeration? I think you patent lawyers call it an art, don't you, is that the term?

Mr. Bourland: I object to that as immaterial.

The Master: Go ahead.

The Witness: All right.

A. The application of the broad principles of refrigeration is very old. But, insofar as commercial refrigeration is con-

cerned there was very little of it prior to 1890 in the United States. The early attempts that were made soon showed those interested that a great deal of mechanical development had to be done in connection with the apparatus used.

The first great difficulty that was encountered was in connection with compressors. Many of the early compressors were so constructed that if they got liquid back of the suction side, got it into the cylinder, it would knock the head off the compressor. Devices were developed to eliminate that possibility and the compressors were redesigned to take care of liquid shocks.

Early Difficulties in Design

Then the whole question of strength of the piping and the tanks and evaporators and condensers had to be gone into by the mechanical engineers. The industry had no standards. A great deal of work was done by rule of thumb. There were no tables of strength and gradually the industry developed suitable pipes and suitable appliances.

There were many serious accidents and many people were killed in connection with refrigeration plants. There was no such thing as household refrigeration as we now understand it prior to 1919. In that year I made a rather careful survey of the refrigeration industry in the United States and found less than 3,000 household refrigerators. There are at the present time, probably in excess of 3,000,000 household refrigerators in use.

Mr. Wermuth: Q. In the United States?
A. In the United States. The lessons that we learned in connection with handling of gases in the larger plants and the tests that had been formulated as a result of the experience in the larger plants were all applied to the household machines, which is one reason why that industry grew so rapidly. They knew pretty well where they were going and what they wanted to do in respect to handling refrigeration based on the experience gained in the larger plants.

Large and Small Flanges

The difference between large, between the large and the small installations can be very well evidenced by the two pieces of pipe which I have before me. I will describe first a piece of pipe as used in an ordinary ammonia system. You can see this is a heavy pipe. At the time the refrigeration industry started there were no standards for making a pipe of this kind. They had no flanges that were standardized, each manufacturer made his own. Some of them were thick and substantial and others were thin.

The Master: Q. What do you mean by "flange"?

A. The flange is the coupling by means of which these two pipes are connected.

The Master: Oh, yes.

A. If you take off these bolts you have here, two pieces which you want to join together—

The Master: Yes.

A. Instead of joining these pipes with the ordinary union—

The Master: Yes.

A. —in ammonia work, handling pressures that are required, and the test pressure on the high side is 300 lbs.—

The Master: Yes.

The Witness: —they use a flange of this description with a gasket which does not rely on the metal threads in the pipe to hold it together, but which relies on these two bolts so that there can be no question as to the pressure that is applied on there to feel that joint.

Finally codes came into existence and specifications for making these parts, and we did not leave to the buyer the choice as to what he had to use in his plant, but which specified that for him in order to take care of the life of the employees and the danger to surrounding property.

Q. What codes came into existence, I mean, just generally?

Development of A.S.R.E. Code

A. Well, the code of the American Society of Refrigeration Engineers. They started on that code about 10 years ago, and in connection with that practically all the engineering organizations in the United States cooperated, among which were the Refrigeration Machinery Association, the American Gas Association, the American Institute of Electrical Engineers, the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Society of Refrigeration Engineers, the International Association of Governmental Labor Officials, the Bureau of Safe Transportation of Explosives, the National Bureau of Casualty and Surety Underwriters, the National Fire Protection Association, National Safety Council, New York Board of Fire Underwriters, United States Bureau of Standards, United States Department of Labor and many others, so that the code finally promulgated and approved by the, as the American Standard, by the American Standard Association in October, 1930, represented the best thought of everybody that had any knowledge about the hazards of refrigeration, and the standards that should be applied to refrigeration and the handling of refrigeration gases, and I believe in connection with the formulation of that code that the Ice Association, the association to which the complainants here are members, also participated in the formulation of that code and were represented by a committee.

The various city codes that have grown up since the formulation of the American Standard Code have in the large majority of cases merely copied the main provisions of the code.

Mr. Bourland: I move to strike it out, the latter part of the answer and I move to strike out the entire answer of the witness as being a conclusion of the witness.

The Master: He is an expert and we will have to let it stand for what it is worth.

The Witness: A comparison of the various city codes in use today will show that they are all based upon the standard code, and so far as their technical provisions are concerned, they are almost identical with the standard code.

Now, to resume this question as to the gradual building up of information on which to construct systems, when the household system came into use, they found out that instead of hundreds and perhaps thousands of feet of pipe to deal with high-pressure refrigerants, that they had comparatively low-pressure refrigerants, and very short lengths of pipe. In fact, in the average household machine there is less than 6 ft. of pipe and that pipe is relatively small. So they adopted as standard small copper pipes of this character (indicating). At first, they had great trouble with these pipes bursting in the seam. After some years, that question of bad pipes all disappeared because they are now made under standards.

Use of Drop Forgings

Then the question of unions by means of which these pipes are connected to various parts of the apparatus came up. At first they were turned out of ordinary bar stock, and they would split and leak through the threads. All the manufacturers very willingly gave up that type of connection as soon as the drop-forged type of union now almost exclusively used was made available to them.

Q. Now, will you just briefly give the dimensions of piping in a household unit as compared with the dimensions in a commercial plant, I mean the diameter and the other factors?

A. The unit type of household machine commonly employs a 1/4-in. copper tubing, having a wall thickness of .035 in., and a hydraulic pressure required to burst of approximately 14,000 lbs. per in. Copper has a melting point of 1,981° F. The standard 1/2-in. copper tubing used has ordinarily a thickness of .035 in. and a hydraulic pressure required to burst of approximately 4,500 lbs., from the standpoint of bursting pressure.

Mr. Bourland: You said with reference to the other, 14,000 lbs. per in., and now 4,500 lbs.; did you mean that?

A. Both figures as given are correct, the smaller the diameter the higher the bursting pressure.

High Safety Factor

Both of these pipes, as commonly used in the household refrigerator, far exceed in tensile strength any possible condition of pressure that could develop in the machines under any set of conditions that would be met with in ordinary operation, or even in the case of a fire. I could conceive of there you could build a fire under one of these refrigeration machines and generate enough pressure in it to burst a pipe, but if it was in a building and the fire was not hot, everybody in there would be long dead before the pipe burst.

The percentage or factor of safety of piping in the household refrigerator is considerably in excess of that in the large refrigerating plant.

So, based on the experience with the early plants where painstakingly and at the expense of many lives, the industry learned its lesson, the so-called household machine came into existence. We had available at that time all of the experience of the large plants and the development, the commercial development of the household machine was largely an adaptation of the old principles, plus the knowledge that had been gained by practical experience in the field.

Q. To your knowledge, what deaths, if any, have occurred as a result of these household units? You say there are about 3,000,000 now in existence?

12 Accidents in 20 Years

A. The only deaths that I have been able to locate as a result of considerable effort have been those deaths that occurred in the city of Chicago. I have heard of two or three cases of serious illness after which the people died after some months elapsed in which it was suspected that a gas leak from a household refrigerator had caused these deaths. The total number of casualties of all kinds in connection with the household refrigeration that I can learn is less than a dozen for the entire United States for the past 20 years, in connection with household and multiple systems of refrigeration—

The Master: Does that include the city of Chicago?

A. That includes those in the city of Chicago. The total number of deaths as reported by the National Safety Council, which is the statistical bureau for the life insurance people and for all kinds of industrial casualty insurance people for the year 1929 and 1930, as given in their booklet, 1931 edition, out of a total of 98,258 deaths by accident in the United States in the year 1929, there was a total of 2,735 by the absorption of irrespirable, irritating or poisonous gas. I find out by inquiry of the council that they have never received enough reports on accidents and death—

Mr. Bourland: I object to that. That is the worst kind of hearsay evidence.

The Master: Well, he is testifying as an expert. You cannot bring in the council.

The Witness: There has not been enough reports of accident and death in the household refrigeration field for them to segregate these from the total number of deaths from illuminating gas and other accidents of various kinds.

Mr. Wermuth: Q. Such as monoxide gas?
A. Monoxide gas and ordinary poisoning from gas, poisoning from escaping gas from gas stoves.

Compares Gas Stoves

The whole question of the relative danger of household refrigeration and other domestic appliances to which a man's family is subject in the house, can be very readily comprehended if you consider the refrigerator as a domestic appliance and compare it with its next neighbor in the kitchen, the gas stove.

The court will certainly take judicial notice that no day passes but what we have in the daily press reports of gas casualties. In the last three weeks in the New York City papers alone have appeared the reports of over 20 deaths from this cause, illuminating gas.

Mr. Wermuth: Q. Will you go ahead with the multiple system?

A. As to the development of the multiple (Concluded on Page 10, Column 3)

SERVICE HINTS

By FRANK W. GRAY

A COMMERCIAL electric refrigeration job, which illustrates an interesting phase of service diagnosis, recently puzzled an experienced engineer for several days.

An ice cream freezing machine was being installed in the store of an ice cream retailer. This ice cream freezing machine—of which there are several types now on the market—consists of a storage compartment for the ice cream mix, an electrically driven stirring mechanism which beats the ice cream to a velvety texture while the freezing is taking place, and a hardening cabinet in which the cans of ice cream are brought to the proper consistency for serving. Such machines are ice cream factories in miniature, and present favorable sales possibilities to commercial refrigeration dealers.

The ice cream freezing machine was ordered from the factory with direct expansion coils specified—for reasons which I shall take up later. Since a temperature of -20° to -30° was required in the freezing compartment as well as in the hardening cabinet, a methyl chloride system was specified, an automatic expansion valve being used.

When the ice cream machine arrived from the factory, the ends of the expansion tubing left projecting from apertures in the cabinet were clearly marked "in" and "out." The service man naturally coupled up his expansion valve to the end of the tubing marked "in," and flare-connected his suction line to the extremity of the tubing marked "out."

When the compressor was started up, the controls were set to cut in at 5 lbs. back pressure, and out at 6 in. of vac-

uum—which adjustment with a methyl chloride direct expansion system should produce the required temperature.

Within a short time after the system had been put into operation, the compressor was found to be dry of refrigerant, while the temperature of the cabinet had pulled down no lower than zero.

Varying amounts of methyl chloride were added until about 15 extra pounds were in the system, while the control was set down to cut out at about 18 in. of vacuum. Still the temperature did not pull down, and the machine continued to run.

It was suspected that there might be a leak. A thorough test of the system disclosed none. Then the service man tested the expansion valve to find whether it were plugged up, tested the compressor for leaky piston or discharge valves, and checked the brine in the cabinet to see whether it might be frozen. These tests disclosed no defect in hook-up. From time to time the suction line frosted back to the compressor.

The service man then suspected there might be a leak in the expansion tubing which was sealed within the cabinet. But when the system was pumped down a pressure and vacuum test proved the tubing to be tight.

As a last resort the service man changed his expansion valve from the aperture on the cabinet marked "in" to the aperture marked "out," and reversed his suction line accordingly. Almost immediately the system began to pull down to the required temperature and showed signs of normal operation. High head pressure disclosed that the system was now overloaded with refrigerant. When about 15 lbs. of methyl chloride had been pumped out, the head pressure was normal, and perfect operation resulted.

The condition which caused this complex unbalanced operation was simply this—the engineer at the ice cream freezer factory had so marked the outlets of expansion tubing that the expansion valve was connected at the bottom instead of at the top.

Since the expansion was upward instead of downward, the extremely low temperature in the freezing coils caused an increasing surplus of liquid methyl chloride to collect in the freezing coils, thus retarding normal expansion of the refrigerant and preventing the required circulation of the refrigerant back to the compressor. The frosting back on the suction line was, of course, due to an overflow of this surplus liquid methyl chloride into the suction line.

Many designers of expansion valved operated cooling units still cling to the principle of expanding the refrigerant up from the bottom of the coil instead of down from the top. Their reason for doing this is probably to insure a more complete expansion of the refrigerant.

In high temperature cooling units the results of this method are not so pronounced, since the refrigerant expands into a gaseous state immediately upon being released from the valve into the warmer coils. But in low temperature

Independent Servicing Of Commercial Units

An executive of one of the leading manufacturers of commercial refrigerating machines recently pointed out that the trend of some commercial cabinet manufacturers to market their display cases, soda fountains, ice cream cabinets, etc., complete with the refrigerating system is providing a substantial business for independent service operators.

He explains that his organization, as a supplier of condensing units to cabinet builders who have elected to furnish commercial equipment with refrigeration, has compiled a list of independent service companies throughout the country.

When an installation is made in some town which lacks a regular service agent of the machine manufacturer, an arrangement is made for a reliable independent service company to handle the installation and service work, he reports. Complete service and operating instructions are furnished, and replacement parts are made available.

cooling units, such as mentioned above, it may be readily seen that expansion is not so rapid in coils maintained at zero or below, and, therefore, should proceed downward instead of upward in order to prevent logging of the coils.

Gray Prefers Direct Expansion For Low Temperature Coils

Whether methyl chloride or sulphur dioxide is used, the direct expansion, or "dry" system is best adapted to produce temperatures of zero or below. The reason for this is that a certain proportion of oil circulates through the system with the refrigerant, and when the flooded system with boilers is used the expansion of the refrigerant is naturally less rapid at lower temperatures and it is almost impossible to keep from 20 to 40 per cent of oil from accumulating in the boiler and cooling coils. This higher content of oil naturally raises the boiling point of the refrigerant, causing a stagnancy of action which results in harder work with less results for the compressor.

A direct expansion methyl chloride system will produce a temperature of -20° in a heavily insulated cabinet with controls set to cut the machine off at 6 in. of vacuum, and on at 5 lbs. back pressure, while a flooded system with boiler-operated coils will not produce an equal temperature with the same refrigerant even when the controls are set to cut out at 18 in. of vacuum, and in at 3 in. of vacuum.

Service men will readily see from this illustration the advantage of the direct expansion, or "dry" system, both from the viewpoint of efficiency of cooling and efficiency of compressor operation, when low temperatures are desired.

Overhaul Job Discloses Buckled Tubing
A large apartment house which had been giving periodic trouble for several years was recently overhauled by the service crew of a western refrigeration dealer. The tubing was all pulled out of the walls and the conduit, new tubing being installed throughout the job.

It was found upon examination of the several hundred flared connections in the old tubing that a large percentage of them had buckled or split, causing a multitude of minute leaks in the system. This buckling and splitting was due to frost action.

When the new tubing was installed asphaltum paint was used to coat the flared connections, and particularly to seal the space between the flared connectors and the tubing. It was also discovered, upon reseriving all of the old boilers on the job, that most of the needle valves were rusted, corroded, or gummed up, preventing positive action in opening or closing.

When old jobs such as this are overhauled it is generally advisable to make a clean sweep of the situation, putting in new tubing where necessary, and particularly repairing or replacing the needle valves on the boilers.

Installation and Service Accounting

Upon visiting a prominent refrigeration dealer in San Francisco recently, the writer was impressed with the sensible accounting methods used by this man in the operation of his installation and service departments. These departments of the business are distinctly separated from the sales activities insofar as accounting is concerned.

The normal cost of installing domestic machines and various types of commercial machines has been estimated as accurately as possible. When a job is priced by the sales department a certain allowance is added on for the installation of the machine, and this allowance is credited to the overhead of the installation department. Any saving in time or materials which the foreman of the installation department is able to effect by using careful supervision will, of course, go to the credit of the installation department.

This enables him to make a showing on the operation of his department from month to month.

LITERATURE OF MANUFACTURERS

Catalogues, bulletins and other materials recently issued.

Manufacturers are requested to send copies of new trade literature to Electric Refrigeration News.

Rex Cabinets

Specifications and photographs of the Rex Mfg. Co.'s electric refrigerator cabinet line are included in a new catalog.

A page is devoted to price quotations on the full line of 23 models, as well as standard equipment and extras also furnished by the company. Full specifications and dimensions appear under the pictured models in the rest of the pages. Rex cabinets may be had in enamel, lacquer, or porcelain on steel exteriors. All interiors are porcelain.

Truscon Steel Panels

Pages of drawings showing typical uses for Ferroclad Structural Panels feature a new booklet just issued by the Truscon Steel Co., manufacturer of steel products.

A page is devoted to the properties of these panels. Insulation value is treated, as well as sound reduction. Typical applications pictured include those for radiators, spandrels, ceilings, ducts and pilasters, steel doors, dryers, garages and small dwellings, temporary buildings, heating units, containers, and industrial buildings.

Century Fans

An illustrated catalog recently distributed by the Century Electric Co. of St. Louis gives specifications and descriptions of their stationary, oscillating, ceiling, and ventilating fan models for the year.

Construction points are covered in detail by means of diagrammed illustrations of the various models. A page is devoted to a showing of the entire Century line.

Jointite Cork Products

A catalog published by Mundet Cork Corp., New York City, advertising Jointite Cork Products, gives data, specifications, tables, and charts, for the use of the product in refrigeration insulation, soundproofing, heat prevention, heat conservation, vibration deadening, and condensation prevention.

A list of various types of firms using these cork products is given for reference. Drawings, photographs and charts

show specific examples of different types of construction.

Wagner Motors

The Wagner Electric Corp., St. Louis, has issued a loose-leaf bulletin sheet on its type RG brush-riding repulsion-induction motors. Large illustrations of the various parts of the motor are made graphic by red arrows pointing from features of the motor to descriptions of them.

Bristol Controllers

A catalog describing the new free-vane, air-operated recorder controller just presented by the Bristol Co., pictures both wall and flush type models, and gives the following features:

Free vane floating between twin opposing air jets; nozzles designed to conserve compressed air; super-sensitive actuating element; air regulating orifice; diaphragm type pilot valve motor; new type of pilot valve; convenient adjustable air bleeder; visible index arm which is easily set; one or two recording pen arms; standard Bristol 12-in. charts; spring motor or synchronous electric clock as desired; air filter; air gauges mounted inside case; aluminum moisture-proof case, and direct or reverse acting controller.

Prices, principles of operation, and diagrams are part of the catalog.

Corinco Cork Products

A new 40-page booklet, profusely illustrated, has been put out by the Cork Insulation Co., Inc., New York City, explaining the various uses of the product. Divisions of the booklet give the source of cork, what products are made by the company, and what their uses are (insulation, acoustical correction, machinery isolation, etc.).

Other points mentioned are the engineering service offered; a description of Corinco Corkboard and its uses; machinery isolation; examples of typical installations; cork used as pipe covering for acoustical correction; for doors or shelving; and in marine insulation.

Electrofinning

A description of the Roessler & Hasslacher Chemical Co.'s sodium stannate-acetate plating bath is given in detail in a 12-page pamphlet just issued. It may be obtained by addressing the firm at Niagara Falls, N. Y.

The booklet contains information on the composition and preparation of the solution, operating conditions, methods of control and maintenance, methods of testing, features and advantages, specific applications, and other data on the electrofinning process.

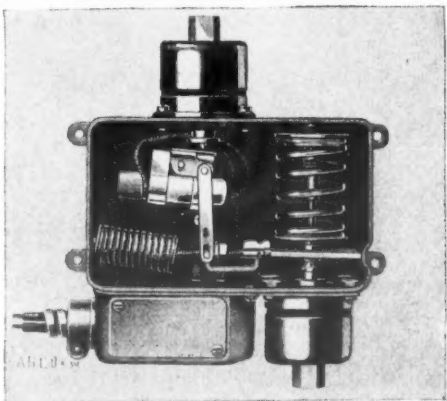
Service men rely on our prompt deliveries from local stocks and OUR PERSONAL SERVICE

EXTRA DRY ESOTOO
Liquid Sulphur Dioxide REFRIGERATION GRADE GUARANTEED

Write, wire or cable where we may serve you. Cable Address "Eustis Boston".

VIRGINIA SMELTING CO.
West Norfolk, Virginia
F. A. EUSTIS, Sec., 131 State Street, Boston and 75 West Street, New York

No. 848 MERCOID DUAL CONTROL



No. 848 IBA Dual Pressure Control

Combines Automatic Control with HIGH PRESSURE CUT-OUT

This Mercoid is built especially for commercial units and provides automatic control with high side cut-out. Both features in one instrument. It is furnished with control either by low side pressure or by temperature. With pressure control the range is 20" vacuum to 15 lbs.; with temperature, minus 30° to plus 60°. Any desired differentials are obtained with either pressure or temperature by a simple adjustment. High side cut-out furnished up to 160 lbs. Employs the well-known Mercoid switch, carrying 110 or 220 volts without arcing or corrosion of contacts.

Thousands of these Controls are now in use in all parts of the world. They operate accurately, continuously at the set points without service. Write today for complete information.

DETROIT LUBRICATOR COMPANY

Trumbull, Lincoln, Marquette & Viaduct
DETROIT, Michigan, U. S. A.

Lubricators • Carburetors • Valves • Automatic Controls for temperature, pressure, humidity. Refrigeration, Oil Burner and Heating Accessories.

Division of AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

Speed Up INSTALLATIONS with IMPERIAL EQUIPMENT

Imperial Tube Cutter
A highly efficient tool for cutting copper, brass, block tin and lead tubing. Takes all sizes of tubing from 1/8" to 3". Makes a right-angle cut, quickly and cleanly, leaving no burrs or chips to clog the line. Tubing does not become out of round as when put in a vise. Cuts tubing in half the time required by old methods. No. 94-F Tube Cutter, each\$2.50

Imperial Tube Bender
Tubing can be quickly bent into desired shape by hand when Tube Bender is slipped over tubing. Set of six benders furnished for 1/4", 5/16", 3/8", 7/16", 1/2", and 5/8" tubing sizes. Price complete \$2.75 set, No. 101 F.....\$2.75

Imperial Flaring Tool
Makes a perfect flare and taper to tubing needed for making up tight joints. Does the work in least time. Simple to operate. No loose dies—no vice necessary. No. 93-F takes 1/4", 5/16", 3/8", 7/16" and 1/2", each.....\$3.00
No. 95-F takes tubing sizes 1/4", 5/16", 3/8", 1/2", and 5/8", each.....\$4.00

Imperial Facing Tool
For Male Flared Fittings
A handy tool for the erector! Removes possibility of leaks due to poorly flared tube joints, frequently the result of male ends of fitting being gouged or threads and seats being non-concentric. Has hardened 7-tooth cutter. Any size from 1/2" to 3". With one bushing\$12.00
Extra bushings each.....\$3.95

Imperial Flaring Tool
It quickly spins out copper tubing to a soft flare—and then burnishes it to a polished surface and a perfect fit with male seat by means of three hardened rollers. Has four hardened jaws for 1/4", 5/16", 3/8", 7/16", and 1/2" tubing No. F-2...\$6.75

NEW FREE CATALOG. The new Imperial Catalog illustrates and describes the complete Imperial Line of Brass Forgings, Valves, Manifolds, Tools, etc. Send for this free catalog today.

THE IMPERIAL BRASS MANUFACTURING CO.
565 South Racine Ave. CHICAGO, ILLINOIS

Artic

(R & H Methyl Chloride)

The
Ideal
Refrigerant

for AIR CONDITIONING SYSTEMS

Efficiently cooled air . . for cars, buildings and homes . . is assured when ARTIC is used in your air conditioning system.

Heat is quickly removed from the air due to the high latent heat of vaporization of this refrigerant. And constant temperatures are easily maintained.

Write for Further Information
The ROESSLER & HASSLACHER CHEMICAL CO.

Empire State Bldg., 350 Fifth Ave. New York, N. Y.



ROME FINNED TUBES

Best for Condensers and Cooling Coils
Send us your blueprints. We make a complete line of Show Case Cooling Coils and Condensers

Rome-Turney Radiator Co., Rome, N. Y.

NORMAN S. WRIGHT & CO.
41 Spear Street
San Francisco, Calif.
Pacific Coast Distributors

FRETZ BRASS & COPPER CO.
523 Arch Street
Philadelphia, Pennsylvania
Representatives

The enameling sheet with increasing popularity— "MICHIGAN METAL"

Sheets suitable for every
vitreous enameling need

GREAT LAKES STEEL CORP.

Michigan Steel Division
Vinewood 2-3650
ECORSE, MICH. TECUMSEH RD.

CELLANITE

for BREAKER STRIP INSULATION

An odorless and odor repelling (non-phenolic) thermal and electrical sheet insulating material. Practically unaffected by moisture, oil, chemicals, and temperature extremes. Will not easily warp, swell, soften or deteriorate. CELLANITE remains accurate throughout long service and offers permanent insulation efficiency under all conditions.

CONTINENTAL-DIAMOND FIBRE COMPANY
NEWARK DELAWARE

Do You Know!



The Leland Electric Co.
Dayton, Ohio, U.S.A.

Canadian Address
Toronto
Cable Address
"Lelect Dayton"

That Leland brush-lift motors, with the special Leland cradle mounting, are unusually quiet and vibration free!

That, coupled with a continuous self-filtering lubricating system, they very rarely require service!

That Leland motors of this design are in widespread use in the field of electric refrigeration—and merit your investigation.

Leland Motors

Testimony Treats Multiple System

(Concluded from Page 8, Column 5)

system, it immediately became apparent when the small refrigerator began to be popular that a building with 30, 40, or 50 apartments in it could best be served by one machine located down in the basement where somebody could look after it and where the question of noise would not enter into it. These machines, even when carefully constructed, under some conditions of use, will make a noise when they start in the night, and they start and stop frequently and people objected to that, and it is also a question of cost. It is much cheaper to put in a system with one piece of machinery in the cellar than it is to put in 50 pieces of machinery scattered around throughout the building. So the multiple system was developed and the household refrigeration engineer was confronted with the necessity,

Screen Guard

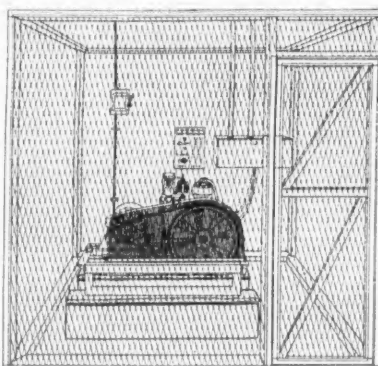


Exhibit 4—Shows how basement condensing units are screened for safety.

and also fully realized the importance of bringing to this new class of work, all of the lessons that he had learned in the old field, and they developed a complete line of apparatus to take care of the piping and the hazard in connection with the multiple system.

The way that was done was to take these same strong-walled copper tubes that were standard in the industry and enclose them in a solid iron conduit, as shown by the small piece that I now exhibit to the court. The two copper tubes are shown inside of this casing, which is required by the Chicago Code. No joints are permitted to be made in that. That must be one continuous copper tube. Where a joint is necessary, that conduit must be run into the box, like the sample we have here, similar to an electric light junction box, which is built into the wall, and the drop-forged fittings to take off and tap, or make a joint, are put into this box. Also valves are put in those boxes so that in case your refrigerator in your apartment leaks, why, the superintendent goes to this box in the hall, or otherwise located outside of the apartment, and with the proper key, shuts off the valve so that any unit evaporator can be isolated from the rest of the system.

Now, in order to prevent any gas from going up from one place to another, these pipes are stopped up with a solid filler, so that this system, when installed, may be considered to be the equivalent of the ordinary gas piping that we have in our residences, except that the pipes are stronger

Junction Box

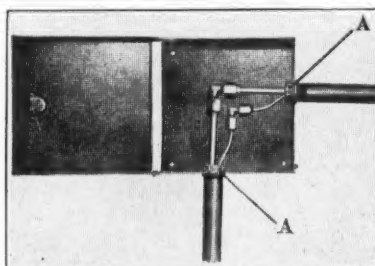


Exhibit 5—Junction box installed where joints are made in copper tubing.

than the ordinary gas pipe, and they are protected from mechanical injury, because if a workman should drive a nail through the plaster wall, instead of puncturing the copper tubing, he only strikes this pipe (indicating).

The Master: You mean the outer piping. The Witness: The outer pipe, and it would be deflected.

Now, when you get inside—
The Master: That is really the protecting cylinder?

The Witness: Yes, sir, yes, your Honor, it is the outer casing.

The machine unit must be protected down in the basement. That machine unit is, according to the code, enclosed in a wire net and locked up in a little screen house all its own. The main reason for that is children play in the basement and they cannot get caught in the machinery.

Now, No. 5 is the junction box I have just referred to, and No. 6 is the view showing the same junction box when valves are used. Defendant's Exhibit 7 shows a refrigerator and the junction box located on the wall adjacent thereto, where the pipe is all concealed.

Exhibit 8 shows the same thing, where the piping is not concealed.

Exhibit No. 9 shows a complete household system with the valves for each evaporator and the riser valves for the compressor, and is entitled, "Instructions for multiple installations," and is issued by the Frigidaire Corp., Dayton, Ohio. It is typical of the best practice in connection with the installation of such units.

Mr. Bourland: The sketch in Defendant's

Box Enclosing a Valve

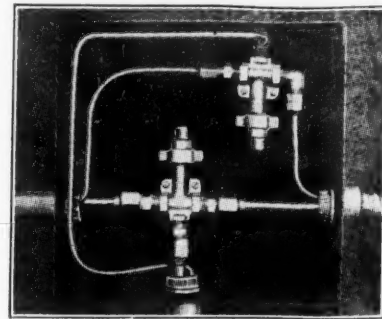


Exhibit 6—Junction box used where valve is installed.

Exhibit 3 is substantially the same as the sketch in Defendant's Exhibit 9, isn't it? What is the use of duplicating?

A. Except for the other sketches, contained in the same exhibit.

Mr. Bourland: Why not withdraw 3 and not duplicate the record?

Mr. Wermuth: We will offer in evidence Defendant's Exhibits Nos. 4 to 9, of this date, both inclusive, and we will withdraw No. 3 because it is, on a reduced scale, the same as the one illustrated in No. 9.

The Master: Any objection?

Mr. Bourland: I would like to look at No. 9. I have no objection to Nos. 4 to 8, inclusive. I would like to have an opportunity to examine No. 9 because it has a lot of pages to it, and I haven't had a chance to read it.

The Master: You can state your objection later. I will admit them all subject to any objection to be hereafter stated as to No. 9, as to the others there is no objection.

(Which said documents last above referred to were received in evidence as Defendant's Exhibits 4 to 9, inclusive, as of 3-25-32, and are attached hereto and made a part of the record in this case.)

Mr. Wermuth: Q. In your opinion is the installation which is provided in No. 9, in accordance with the Chicago Code?

A. I have not examined that particular exhibit to ascertain that fact, but in general I would say it does comply with the code. I know that the instructions issued, of which I have a copy, by this company, do comply fully with all the requirements of the Chicago Code, in my opinion.

Mr. Bourland: I move to strike out the answer.

Kitchen Installation

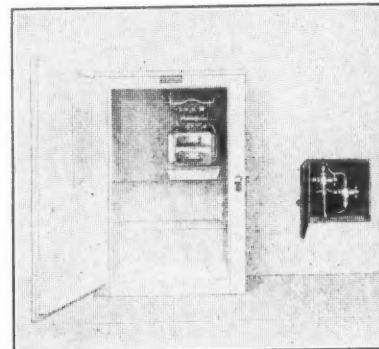


Exhibit 7—Refrigerator with the junction box adjacent; concealed conduit.

The Master: Ruling reserved.
The Witness: It will be observed from these exhibits which have just been introduced that every precaution has been taken to enable any one of the refrigeration boxes to be cut off from the compressor in case of trouble.

Mr. Bourland: I object to that and move to strike out the answer of the witness.

The Master: Let it stand.

Mr. Bourland: "Every precaution has been taken" he says.

The Master: Well, he is an expert.

The Witness: A. The evaporator is provided with a cut-off valve on both the suction and pressure sides. In case of any trouble in that particular apartment, shutting off these valves will prevent any refrigerant from other parts of the system from going into the particular apartment in trouble.

It will also be observed that all of the piping, that is to say, the piping carrying refrigerants is enclosed in an outer casing, and is placed in the wall, and so secured thereto that it cannot vibrate or become loose. In this respect it may be compared to the ordinary water and gas piping. It is not exposed like the majority of piping in an ice plant, and except in case of major repairs it is not disturbed. The nature of the refrigerant used in these systems is such that no corrosion takes place, under usual operating conditions.

Mr. Wermuth: I should like to adjourn at this time.

(Whereupon an adjournment was taken to Saturday, March 26, 1932, at 9 o'clock a. m.)

Tubing Not Concealed

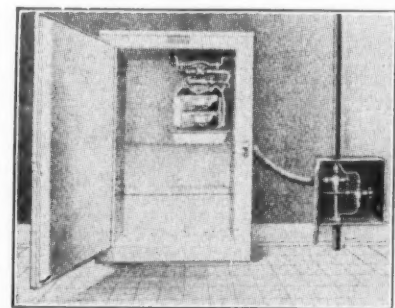


Exhibit 8—Box of a multiple installation with conduit not concealed in wall.

SOLID CO₂ CONTROL DEVELOPED BY YORK

YORK, Pa.—A new method of controlling temperatures produced by solid CO₂ in refrigerated trucks has been developed in the research laboratories of the York Ice Machinery Co.

In previous applications of solid CO₂ to refrigerated truck bodies, efforts have been made to retard its refrigerating effect, but this is the first time control has been applied to solid CO₂ refrigerated trucks, York engineers claim.

Already adapted to the York-Hoover Arti-Matic trucks, the new system condenses a secondary refrigerant, methyl chloride, by very low temperatures, and the methyl chloride flows by gravity to the cooling coils.

When boiled to the gaseous state, the refrigerant returns to the CO₂ chamber and is again condensed, operating on a continuous cycle.

Secondary Refrigerant

The York "Controlled Temperature" CO₂ unit consists essentially of a container for solid CO₂, a condensing coil, an evaporator coil, and a thermostatically controlled valve. The condensing coil is in intimate contact with the solid CO₂ container, and is located at a higher level than the evaporator coil which is in the refrigerated compartment.

Sealed within the two coils, which form a closed system, is a charge of volatile low temperature-refrigerant. In operation, the solid CO₂ in the container in contact with the condensing coil produces a temperature and pressure in that coil very much below that of the evaporator coil.

This pressure difference causes a flow of gas from the evaporator coil to the condensing coil, engineers explain. The result is rapid evaporation of the liquid refrigerant in the evaporator coil and absorption of the heat from the space surrounding it. Due to the low temperature in the condensing coil the gas is condensed and returns by gravity to the evaporator coil.

This cycle will continue just so long as a temperature difference exists between the two coils. Likewise the temperature in the refrigerated compartment will continue to drop.

Interposed between these coils is the thermostatically controlled valve which is actuated by the temperature in the refrigerated compartment. The thermostatic device is set to act at a predetermined point and when this is reached, the valve tends to close.

Valve Governs Gas Flow

Upon a rise in temperature the valve opens. The valve thus governs the flow of gas to the condensing coil and provides automatic temperature control.

The thermostatic valve may be adjusted for any temperature required within a 30° range, according to the announcement. Units can be furnished with the proper valve for maintaining any of the following temperature ranges:

- 30° F. to Zero
- 15° F. to 15° F.
- 5° F. to 35° F.
- 30° F. to 60° F.
- 50° F. to 80° F.

The solid CO₂ container is heavily insulated in order to insure "controlled" refrigeration only to the refrigerated compartment by way of the evaporator coil. Consequently, the consumption of solid CO₂ is in direct proportion to the load except for a slight heat loss through the walls of the container, York engineers claim.

Rapid Heat Transfer

The condensing coil is arranged around the sides and bottom of the solid CO₂ container in order to give rapid heat transfer. The evaporator coil is soldered to a heavy galvanized steel sheet to form the evaporator plate. The evaporator plate includes vertical full length ribs which extend into the refrigerated compartment. This assembly provides not only additional heat absorbing surface and rigid construction, but also makes for ease of cleaning and sanitation, the designers believe.

Even and constant temperature control with low consumption of solid CO₂ are claimed for the new system. Under test, during extreme summer weather, a body unit insulated with 4 in. of corkboard carried 3.5 gals. of ice cream for every pound of solid CO₂ used, York men say.

Adjusted by Thermostat

Simplicity of operation is another feature claimed for the system. It is only necessary to make an initial adjustment of the thermostatic valve. No further attention is required except periodic charging of the container with solid CO₂, the announcement maintains. Convenience and ease of charging solid CO₂ into the container are also claimed.

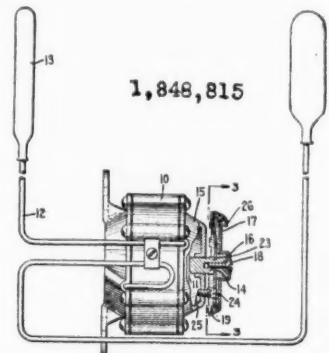
In installation, the evaporator plate is placed against the back or side wall of the refrigerated compartment. The solid CO₂ container with condensing coil is placed against the ceiling of the truck.

Latest Patents Issued in Refrigeration Field

ISSUED MARCH 8, 1932

(Continued from Last Issue)

1,848,815. POSITION INDICATOR. Sven W. E. Anderson, New York, N. Y., assignor to Servel Sales, Inc., New York, N. Y., a Corporation of Delaware. Filed Aug. 22, 1931. Serial No. 558,736. 11 Claims. (Cl. 116-129.)



1. A rotary position indicator comprising a dial having a rearwardly extending notched edge, a member of resilient strip material pivoted concentrically with said dial and having a portion normally engaging in said dial a pointer formed by one end of said member and extending in indicating relation with said dial, a flap struck out of said member perpendicularly thereto, and a fixed stop to intercept said flap.

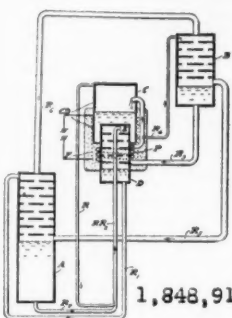
1,848,848. COOLING COIL FOR REFRIGERATORS. William Sloan, Eagleville, Pa. Filed April 11, 1930. Serial No. 443,497. 1 Claim. (Cl. 62-79.)

The combination of a cabinet having a top wall provided with a bore, an inverted bell-shaped receptacle adapted to receive the neck of and support a bottle in inverted position, an annular gasket carried by and adjacent to the free edge portion of said receptacle to cushion a bottle with respect thereto, a tube extending from within said receptacle through said bore and into said cabinet, a planar coil of concentric convolutions of tubing supported upon one end parallel with and adjacent to the inner surface of a side wall of said cabinet, tubular means connecting one end of said coil to said tube, a discharge valve connected to the opposite end of said coil, a valve in said tubular means, a second tubular means connecting said first end of said coil to a second source of liquid, and a valve in said second tubular means, said valves in said tubular means being adjustable to operatively connect said coil either to said receptacle or to said second source.

1,848,918. THERMODYNAMIC PROCESS. Baltzar Carl von Platen, Stockholm, Sweden, assignor to Electrolux Servel Corp., New York, N. Y., a Corporation of Delaware. Filed March 30, 1927. Serial No. 179,675, and in Sweden March 31, 1926. Renewed Feb. 16, 1931. 15 Claims. (Cl. 62-119.5)

1. The process of refrigerating which comprises circulating refrigerant in a solution having a given pressure-temperature curve for conditions of operation, transferring the refrigerant to a second solution having a given pressure-temperature curve for conditions of operation which crosses the first-mentioned curve and effecting the transfer

substantially at the conditions represented by the point of crossing of the curves, circulating the refrigerant in the second solution into heat exchange relation with the



objective of refrigeration, expelling the refrigerant from the second solution in heat exchange relation with the objective of refrigeration to take up heat and transferring the refrigerant to the first-mentioned solution.

1,848,996. AIR COOLING AND HEATING DEVICE. Carl Leslie Dawson, Oklahoma City, Okla. Filed June 15, 1931. Serial No. 544,607. 3 Claims. (Cl. 257-9.)

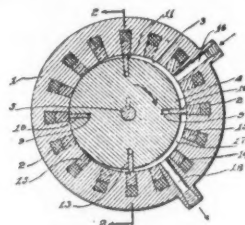
1. A device of the character described comprising a housing, a receptacle centrally located in the housing and providing longitudinally disposed air passages between the side walls of the housing and receptacle, a top covering the space between the receptacle and housing, baffles depending from the top of the housing in the air passages and terminating short of the bottom of said housing, alternately disposed baffles extending upwardly from the bottom of the housing and terminating short of the top, said baffles providing tortuous passages for the air, means for drawing air through the passages, means for affecting the temperature of the air drawn through the passages, one end of the housing having an opening, and an air purifying means in the opening and providing an intake for the air.

ISSUED MARCH 15, 1932

1,849,061. AIR CONDITIONING EQUIPMENT. Samuel M. Anderson, Sharon, Mass., assignor to B. F. Sturtevant Co., Boston, Mass., a company. Filed June 21, 1930. Serial No. 462,779. 4 Claims. (Cl. 257-138.)

1. A unit ventilator comprising a casing having an intake for fresh air, a filter for cleaning said air, a fan for circulating said air, a housing for said fan, a water supply in said housing in contact with said air, means for heating said water supply, and means for heating said air after passing said water supply.

1,849,222. COMBINATION MOTOR AND PUMP. Allen A. Canton, New York, N. Y., assignor, by mesne assignments, to Canton Refrigerators, Inc., New York, N. Y., a Corporation of Delaware. Filed March 7, 1929. Serial No. 345,129. 4 Claims. (Cl. 103-118.)



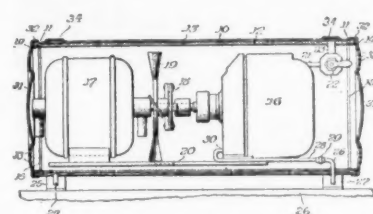
2. A self contained pumping device consisting of a field element forming a chamber for an armature to revolve in, said armature eccentrically mounted on a shaft therein, plates at the end of said field element for fully enclosing said chamber and making same airtight, bearings in said end plates for said shaft, plates slidably mounted in said armature, said slidable plates and said armature directly forming the means to form suction and compression as they revolve, said armature, pumping means and bearings fully enclosed and leaving no openings leading to the atmosphere.

1,849,685. REFRIGERATION. Carl Georg Munster, Stockholm, Sweden, assignor to Electrolux Servel Corporation, New York, N. Y., a Corporation of Delaware. Filed March 22, 1928. Serial No. 263,950. 17 Claims. (Cl. 62-119.5.)

1. Refrigerating apparatus of the absorption type comprising a generator, an absorber, an evaporator, a condenser, means to conduct vapor from the generator to the condenser, a vessel arranged to receive liquid from the condenser, a member in heat exchange relation with said absorber, a conduit connecting said vessel with said mem-

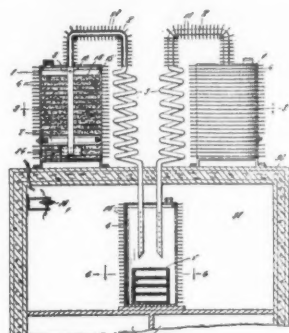
ber and means for conducting vapor from said member to the condenser.

1,849,793. REFRIGERATING UNIT. French E. Dennison, Beloit, Wis., assignor to National Refrigeration Corporation, Beloit, Wis., a Corporation of Delaware. Filed July 21, 1926. Serial No. 123,991. 6 Claims. (Cl. 62-115.)



1. A refrigerating apparatus comprising a cylindrical condenser open at each end and having a condensing chamber formed in the cylindrical walls thereof, a base slidable in and out from within said walls, and a compressor and means for driving the same both mounted on said base.

1,849,931. ABSORPTION REFRIGERATING APPARATUS. Carl Jaeger and William Jaeger, Los Angeles, Calif. Filed June 14, 1928. Serial No. 285,419. 2 Claims. (Cl. 62-118.)



1. A refrigerating apparatus comprising a combined generator and absorption chamber, a stationary granular cooling agent constituting a primary porous absorbing agent stratified within the generator, a secondary absorbent positioned alternated with respect to the primary agent and having a higher heat attraction than said primary agent.

1,849,968. REFRIGERATION VAPORIZER. William O. Voss, York, Pa., assignor to Martin-Parry Corporation, York, Pa., a Corporation of Delaware. Filed March 25, 1927. Serial No. 178,422. 11 Claims. (Cl. 62-126.)

10. A cooling unit for refrigerators comprising a header, a plurality of nested tubes connected with said header and arranged to provide a row of tubes extending longitudinally with respect to the axis of the header, a second row of longitudinal nested tubes laterally spaced from said first row of tubes, the ends of one row of tubes communicating with one side of the header and the ends of the second row of tubes communicating with another side of the header.

1,850,031. METHOD OF AND MEANS FOR DEFREEZING FROZEN BEEF, MUTTON, LAMB, AND THE LIKE. Arthur Rayson, Elsternwick, near Melbourne, Victoria, Australia, assignor to The Anglo-Australian Freezing Company Proprietary Limited, Melbourne, Victoria, Australia. Filed Aug. 21, 1928. Serial No. 301,048, and in Australia Jan. 31, 1928. 6 Claims. (Cl. 99-14.)

1. Method of defreezing frozen products consisting in first subjecting the product to a revolving motion and whilst revolving subjecting it to water the temperature of which is such that thawing will take place, then subjecting the product to a blast of warm air and with the product still revolving subjecting it to a blast of cool air for the purposes specified.

ISSUED MARCH 22, 1932

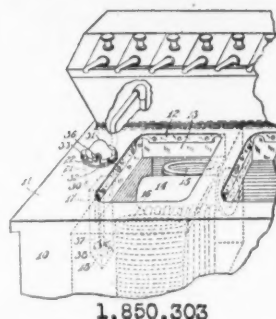
1,850,069. AIR CONDITIONING APPARATUS. William G. Beatty, Anderson, Ind. Filed Jan. 27, 1930. Serial No. 423,752. 5 Claims. (Cl. 257-137.)

1,850,241. THERMOSTAT. Warren Noble, Detroit, Mich. Filed Nov. 29, 1929. Serial No. 410,323. 7 Claims. (Cl. 200-140.)

1. In combination with a thermostatic switch, a switch arm having a cup fixed therein, a gas chamber having a flexible end wall capable of distending to compensate for the change in volume of the gas in said chamber under varying temperatures, a cup in said end wall and a link having one end supported in the cup in said end wall and the other end supported in the cup of said switch arm whereby distension of said end wall under a rise of temperature of said gas actuates said switch arm in one direction, yielding means resisting outward displacement of said link, and means for varying the compression of said yielding means to vary the temperatures under which said switch will close under actuation of said end wall.

1,850,303. ACCELERATOR FOR REFRIGERATION UNITS OF SODA FOUNTAINS. Franklin Hunt, Chicago, Ill., assignor to The Liquid Carbonic Corporation, Chicago, Ill., a Corporation of Delaware. Filed March 21, 1929. Serial No. 345,738. 8 Claims. (Cl. 62-160.)

1. In a soda fountain, the combination with the main heat-insulated body having a perforated metal cover plate and a perforated top, a liquid-container arranged in said body below said perforations and a boiler of a mechanical refrigerator and water coils in said container, of a propeller arranged in said container below the normal liquid level thereof, and a small electric motor having a vertical shaft carrying said



propeller, the body of said motor being grounded upon the metal cover plate.

1,850,371. CONTROL VALVE. Frederick E. Beebe, Euclid, Ohio. Filed Sept. 6, 1927. Serial No. 217,635. 8 Claims. (Cl. 236-99.)

1. In a thermostatic control mechanism, a valve consisting of a casing open at each side and having an inlet and an outlet and a central valve seat member, an apertured cup mounted in each side, a sealing diaphragm mounted between each of said cups and said casing, and a valve member mounted in said casing and consisting of a tube extending through said diaphragms and said apertures in said cups, and a valve plug mounted on said tube between said diaphragms and sealed thereto and temperature responsive devices mounted on the two sides of the casing and operable against said tube to control movement of said valve.

1,850,394. ROTARY COMPRESSOR. Frank Horawa, Detroit, Mich. Filed March 5, 1928. Serial No. 259,055. 11 Claims. (Cl. 230-146.)

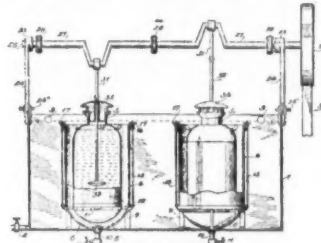
9. A rotary compressor comprising a casing, a stationary drum mounted in said casing, a piston of smaller diameter than said drum, a rotatable eccentric shaft, an open cylindrical spring having the convolutions thereof spiralled around said eccentric shaft, said spring having convolutions of varied diameters with certain convolutions contacting with the eccentric shaft and certain convolutions contacting with the inner wall of said piston, and means carried by said piston for engaging said drum to prevent rotation of said piston.

1,850,414. REFRIGERATOR CAR. Damian L. Reynolds, Hillsborough, Calif., assignor of one-half to Luther L. Yates, San Francisco, Calif. Filed Sept. 23, 1929. Serial No. 394,693. 19 Claims. (Cl. 62-19.)

1,850,473. METHOD OF SOLDERING FINS TO TUBES. Charles William Owston, Detroit, Mich., assignor to McCord Radiator & Mfg. Co., Detroit, Mich., a Corporation of Maine. Filed March 3, 1928. Serial No. 258,899. 6 Claims. (Cl. 219-12.)

1. The method of soldering the fins and tubes of a radiator core together after being assembled with the tubes extending through openings in the fins, consisting in having the solder to be melted at the joints between the fins and the tubes, and then passing a suitable electric current through the tubes, to heat the tubes and the adjacent edge portions only of the fins about and in contact with the tubes to the fusing point of the solder for soldering the fins to the tubes and allowing the remaining portions of the fins to be exposed for radiating the heat therefrom to maintain the fins relatively cool to prevent the loss of temperature from the fins.

1,850,500. MILK COOLER. John W. Goble, Gosport, Ind. Filed May 4, 1931. Serial No. 534,992. 8 Claims. (Cl. 257-208.)

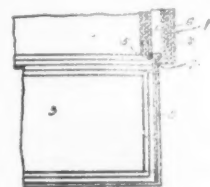


1. A milk cooler including a main tank, one or more cooling units mounted in the tank and each comprising an auxiliary tank adapted to receive a milk can in spaced relation to its walls, a water inlet connected with the bottom of the main tank and the auxiliary tank, and an overflow pipe connected to the upper end of the main tank.

1,850,514. REFRIGERATOR DOOR. Ernest Henry Norwood, St. Petersburg, Fla. Filed Nov. 16, 1929. Serial No. 407,723. 2 Claims. (Cl. 20-35.)

1. The combination with a refrigerator

having a door opening, of a door having shoulders about its inner face, a hinge extending transversely of the refrigerator and connecting the door thereto to swing in a vertical plane, said hinge acting to close the opening between the lower edge of the door and the refrigerator, said refrigerator body at each side of the door opening having a recess formed therein, a quadrant plate at each end of the door having one straight edge secured thereto and having the other straight edge permanently within said recess, said plate being adapted to substantially completely enter the recess when the door is closed, said opening having abutment shoulders engaged by the door shoulders, those abutment shoulders adja-



cent the recesses being upon the inner sides of the recesses, and means for preventing the complete removal of the plate from the recess.

1,850,527. REFRIGERATOR. Edmund E. Allyn, Cleveland, Ohio. Filed Aug. 31, 1927. Serial No. 216,558. 7 Claims. (Cl. 62-118.)

1. Refrigerating apparatus of the intermittent absorption type, comprising a still-absorber, a heater therefor, and an evaporator including a storage portion and two cooling portions, the storage portion being heat insulated from the cooling portions, a casing having chambers separately enclosing said two cooling portions, means for controlling air circulation in one of said chambers, and controlling means for said heater, including means responsive to temperature changes in a zone between the storage portion and both cooling portions of the evaporator.

1,850,907. REFRIGERATION. George Andresen, Chicago, Ill., assignor to W. B. Parkyn, Chicago, Ill. Filed July 29, 1929. Serial No. 381,862. 3 Claims. (Cl. 61-115.)

1. In refrigerating apparatus the combination of a compressor employing a sealing liquid, a separator for the compressed refrigerant and the sealing liquid delivered by said compressor, a condenser for condensing the compressed refrigerant, an evaporator in communication with said condenser and with the inlet of the compressor, and a conduit through which the sealing liquid separated from the refrigerant is returned to said compressor, said conduit being so disposed that it is subjected to the temperature-controlling effect of the refrigerant cooled by said condenser.

1,850,952. REFRIGERATING APPARATUS. George Andresen, Chicago, Ill., assignor to W. B. Parkyn, Chicago, Ill. Filed May 2, 1927. Serial No. 188,343. 21 Claims. (Cl. 62-126.)

1. In a gas-liquefying apparatus, the combination of an evaporator element comprising a hollow member to which liquefied gas heavier than oil and mixed therewith is supplied and having an opening adjacent its top, and a trap-forming housing at the upper portion of said member and communicating with said opening, said housing being spaced laterally from said member and containing an upper gas and oil outlet below said opening in said element and a lower opening, the latter in communication with said member.

NEW LINK-BELT PRESIDENT

CHICAGO—George P. Torrence, formerly vice president in charge of Link-Belt operations in Indianapolis, was elected president of Link-Belt Co. at the 58th annual meeting of the stockholders recently.

REFRIGERATION RUBBER WARE

Door and Frame Insulating Strips. Gliders for Refrigerator Legs. Top Hole Sections. Lid Collars, Sleeves, Brine Hole Stoppers for Ice Cream Cabinets, etc. Specializing in Parts Made to Customer's Design.

THE AETNA RUBBER CO.
ASHTABULA, OHIO

PROFESSIONAL SERVICE

Testing Laboratory
For refrigerators
and refrigerating equipment
George B. Bright Co.
Refrigerating Engineers and Architects
2615 12th St., Detroit, Mich.

PATENTS

Searches, Reports, Opinions by a
Specialist in REFRIGERATION
H. R. VAN DEVENTER
Solicitor of Patents - Refrigeration Engineer
342 MADISON AVE. NEW YORK

WHAT EVERY ELECTRICIAN WANTS TO KNOW

Is easily found in **AUTOMATIC NEW ELECTRIC LIBRARY**. Electricity and all electrical works. Questions, answers, diagrams, calculations, underwriter's code, design, construction, operation and maintenance of modern electrical machines and appliances FULLY COVERED. Invaluable at small cost, easy terms. **BOOK-A-MONTH** service puts this NEW information in your hands for 5c a day. Write TODAY for Electric Folder and FREE TRIAL offer. Theo. Audel & Co. 65 W. 23rd St. New York.

Ansul Sulphur Dioxide

UNIFORM ALWAYS

For direct charging.

Pure, bone dry. Every container analyzed. A perfect product guaranteed.



Nine sizes of cylinders from 2 to 150 pounds. Also ton drums. Stocks in principal cities.

ANSUL CHEMICAL COMPANY

MARINETTE - WISCONSIN



BUSH

FINNED TUBE
CONDENSERS

Having specialized in the manufacture and fabrication of Finned Tubing for 22 years we are in an excellent position to take care of your condenser requirements.

THE BUSH MFG. CO., HARTFORD, CONN.